An Investigation of String Project Teachers' and Directors' Perspectives on the Skills and Behaviors Important for String Teaching

by

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ABSTRACT

This study examined directors', master teachers', graduate and undergraduate String Project teachers' perspectives of the skills and behaviors important for teaching strings. Participants were from the 40 String Projects listed on the National String Project Consortium website, including String Project directors (n = 16), master teachers (n = 7), graduate (n = 6) and undergraduate string teachers (n = 46) involved in String Projects across the United States. Participants ranged in age from 18 to 72 years old.

The survey for this study was based on Teachout's 1997 survey pertaining to teachers' skills and behaviors in three categories: teaching, personal, musical. A cover letter containing a link to the electronic survey was sent to directors and master teachers for the 40 String Projects, requesting their participation and the participation of their string teachers. Seventy-five participants from 19 String Projects completed the survey.

Means and standard deviations were calculated for each item for each of the four participant groups. Overall means for each category of skills and behaviors were calculated followed by a one-way Multivariate Analysis of Variance (MANOVA) to determine which of the three categories the teachers and directors believed most important. Three one-way MANOVAs were used to analyze participants' perspectives for three broad categories of skills and behaviors (personal, teaching, and musical) across the four participant groups. No significant differences were found across all three MANOVA analyses. Additionally, descriptive statistics were used to determine the rankings of importance for the four participant groups on 40 survey items. Results

showed that participants in all four groups believed that personal skills and behaviors were more important than teaching and musical skills and behaviors.

Also conducted were Pearson Product-Moment Correlations, which analyses revealed a strong positive relationship between the ranked perceptions of musical and teaching skills and behaviors ($r = .78$, $p = .00$), between musical and personal skills and behaviors ($r = .65$, $p = .00$), and between personal and teaching skills and behaviors ($r = .84$, $p = .00$). Strong positive correlations were found between the three categories. Recommendations for research and practice were given.

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Chapter One

Introduction

One of the biggest challenges that faces the field of string music education is the shortage of qualified string teachers. This shortage is due in part to the increasing number of students participating in school orchestra programs and the high attrition rate of string teachers due to retiring or moving out of profession (Brenner, 2010; Gillespie & Hamann, 1999), as well as the fact that most well-trained high school string students do not pursue a degree in music education (Brenner, 2010). Several attempts have been made to rectify the string teacher shortage, including offering string education scholarships and producing material that aids teachers in interesting string students in teaching (Gillespie & Hamann, 1999).

Brenner (2010) indicated that well-prepared high school string teachers who possess both propositional and procedural knowledge are necessary to establish good public-school string programs. Propositional knowledge is a form of knowledge that can be represented in logical statements and language. It is the "know that" form of knowledge. Examples of propositional knowledge include, but are not limited to, theories, concepts, philosophical statements, and understanding of the content that music education students study through teacher-education programs. In contrast, procedural knowledge is a form of knowledge that is difficult to express in statements or natural language, therefore it is usually demonstrated through physical actions and skills. Examples of procedural knowledge in a string teaching setting include demonstrating on an instrument, singing, and conducting.

However, because of the complex nature of the music teaching and learning processes, some information or understandings require a combination of procedural and propositional knowledge. For example, information that comes in the form of steps to learn certain skills can be considered both propositional and procedural. Brenner (2010) said that equilibrium of procedural knowledge and propositional knowledge forms a comprehensive understanding required for music teaching

The skills and instructional behaviors that preservice and experienced string teachers demonstrate in string group instruction and private lessons represent both procedural and propositional forms of knowledge, acquired through teacher-education courses, applied lessons, student teaching experiences, and previous experiences. Hamann, Lineburgh, and Paul (1998) found a significant positive correlation in preservice teachers' scores on the Survey for Teaching Effectiveness (STE) and their scores on the Social Skills Inventory (SSI) in three areas: social expressivity, social sensitivity, and social control.

Abrahams and Conway (as cited in Hamann et al., 1998), however, indicated a discrepancy between music education coursework and student teaching. In their studies, they found that, in many cases, student teachers were not required to apply the skills and knowledge they gained throughout their coursework until they started student teaching, thus leaving a huge gap between skill acquisition and application. The researchers also suggested that students start participating in field experience early in the degree program, to bridge the gap between skills acquisition in coursework and application in real-world situations.

One way to do so is to create learning spaces for both preservice string teachers and school students. In his book *Music Matters,* David Elliott said:

> The practicum context is an effective learning environment because different kinds of knowing are invoked and exemplified precisely when they are needed, rather than at some arbitrary location in a lecture, text, or syllabus, or at some arbitrary location in a teacher-proof text. Students observe first-hand how their musical thinking (and the thinking of their teachers and peers) solves and reduces musical problems (or not) and locates the creative promise of musical ideas (or not). (Elliott, 2014, p. 425)

Paul, Teachout, Sullivan, Kelly, Bauer, and Raiber (2001) found that student teachers are highly motived when engaged in problem solving activities that present problems in an environment resembling actual professional practice. Authentic Context Learning activities (ACL) is an idea first introduced in medical education in an effort to bridge the gap between fact-based learning and patient-care-based learning. Authentic Context Learning was later adapted by experts in the field of music teacher-education programs in peer teaching and the student teaching practicum, providing early field experience to future music teachers (Paul et al., 2001). Additionally, Authentic Context Learning activities allow the student teachers to reflect on their own and their peers' teaching either during or after their early-field experience.

Before formal schooling, apprenticeship was the common means for teaching and learning (Elliott, 2014). Apprenticeship was used to transmit knowledge and skills from experts to their students. The concept of practicum dates back to this ancient model of education. Elliott elaborates:

> One of the most important educational features of the curriculum-as-practicum is that it contextualizes or situates learning. When teachers place productive musical actions at the center of the music curriculum, students experience the practicality of several related forms of musical knowing immediately and regularly. They witness the reasons underlying musical procedures, practices, and concepts and grasp these reasons concretely. (Elliott, 2014, p. 425)

ACLs may be similar to a practicum. Paul et al. (2001) examined the relationship between Authentic Context Learning and the teaching performance of undergraduate instrumental music student teachers. In their study, they identified four authentic context learning variables found in instrumental music education curricula including:

> a) early field experience teaching episodes in instrumental music teaching settings, b) peer teaching episodes in instrumental music teaching settings, c) episodes of subjects watching episodes of their teaching, and d) episodes of subjects watching episodes of their teaching with a coaching instructor. (Paul et al., 2001, p. 138)

Paul et al. found a significant relationship between initial teaching performance of undergraduate instrumental music teachers and number of instrumental music early-field experience teaching episodes, number of instrumental music peer-teaching episodes, and number of times that teaching videos were watched. This is where programs such as the String Project come into play, providing hands-on teaching experiences, as well as invaluable feedback from experienced and knowledgeable string teachers, to those who will hold future string teaching positions.

Preservice teachers also develop ideas about effective teaching from their own experiences as students and from years of observing teachers, which Lortie (2007) calls the “apprenticeship of observation.” These ideas and understandings, acquired throughout

their life as learners, are carried out through their professional life as teachers. Moreover, from their teaching experiences, preservice teachers refine their ideas about effective teaching (Schmidt, 2010).

Some studies investigated the perspectives of preservice and expert teachers regarding the skills and behaviors important for music teaching (Davis, 2006; Edelman, 2016; Heath-Reynolds, 2014; Moss, 2007; Teachout, 1997; Whitaker, 2011). Teachout (1997) examined the opinions of preservice and experienced music teachers regarding the skills and behaviors necessary for successful music teaching. He identified three broad categories for the skills and behaviors found in music teaching: personal skills and behaviors, teaching skills and behaviors, and musical skills and behaviors. Teachout found that all participants believed statements assigned to the personal skills and behaviors are the most important skills and behaviors, followed by teaching and musical skills and behaviors.

Five studies adapted Teachout's survey, examining teachers' perspectives on teachers' skills and behaviors important for teaching music. In Miksza, Roeder, and Biggs' study (2010), band directors ranked items that belong to the personal skills and behaviors category the highest followed by teaching skills, and musical skills and behaviors respectively. Miksza et. al. also found "Maintain high musical," "be able to motivate students," and "enthusiastic, energetic" are the highest ranked items. Moss (2007) compared the perspectives of novice and experienced instrumental music teachers regarding the characteristics of effective instrumental music teachers. Moss reported an agreement in perspectives between novice and experienced teachers, with personal

characteristics ranked the highest, followed by teaching and musical characteristics respectively.

MacLeod and Walter (2011) also adapted Teachout's survey to examine cooperating teachers' perspectives regarding the level of preparedness of student teachers at the beginning of their student teaching experience. Their findings were consistent with the previous studies based on Teachout's survey. MacLeod and Walter also reported agreement regarding importance ranking of the three broad categories of skills and behaviors between orchestra, band, and choir teachers.

Edelman (2016) examined the perceptions of cooperating mentor teachers regarding the skills and behaviors important for successful student teaching experience. Edelman found that cooperating mentor teachers believed skills and behaviors statements belonging to the personal skills and behaviors category were the most important skills and behaviors, followed by teaching and musical skills and behaviors.

Davis (2006) compared the perception of music education students in their first year with that of music student teachers regarding the skills and behaviors as predictors of success in music teaching. Davis adapted Teachout's 40-item survey pertaining to the skills and behaviors important for music teaching. She used Teachout's designation of the 40 items on the survey to one of three broad categories of skills and behaviors: personal, teaching, and musical skills and behaviors. Davis also found that both first year music education students enrolled in music education courses and music student teachers believed personal skills and behaviors are most important for successful music teaching, followed by teaching and musical skills and behaviors.

However, none of these studies has explored String Project teachers' perceptions of the skills and behaviors important for successful teaching in a String Project. String Projects offer a unique opportunity to connect propositional and procedural knowledge in an authentic teaching setting. Therefore, it is important to understand how String Project teachers think about teaching. Since the inception of the first String Project in 1948, only a handful of studies have been conducted to examine String Projects in the United States. Most of the literature I found discusses string-training programs and outreach string programs other than the String Projects. With my study, I hope to contribute to that body of literature, as well as to the limited research focused on String Projects.

The Purpose Statement

The purpose of the current study is to investigate the perspectives of the teachers, master teachers, and directors who are involved in String Projects across the United States regarding the skills and behaviors important for teaching in a String Project.
I formulated the following research questions to guide this descriptive study:

1. What are the skills and behaviors that string project directors deem most important for successful string project teaching?
2. What are the skills and behaviors that String Project master teachers deem most important for successful String Project teaching?
3. What are the skills and behaviors that undergraduate String Project teachers deem most important for successful String Project teaching?
4. What are the skills and behaviors that graduate student String Project teachers deem most important for successful string project teaching?

5. Are there any differences in the three categories of skills and behaviors deemed important according to all roles in the project?
6. Are there any differences between the perspectives of the graduate and undergraduate string teachers regarding the skills and behaviors that they deem important according to their semesters of teaching in the String Project?
7. Are there any relationships between music teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors?
8. Are there any differences in perspectives by age, gender, or academic major?

The History and Purpose of String Projects

The first String Project, called the Junior String Project, was founded in 1948 at University of Texas at Austin shortly after World War II by William Doty, the founding dean of the College of Fine Arts, and Albert Gillis, who served as the first director of the program for 10 years (https://stringproject.music.utexas.edu). In 1974, at the University of South Carolina, John Bauer, violin professor, and William Moody, the director of the school of music, founded the USC String Project. Robert Jesselson served as the director of the String Project for the first 15 years, then Gail Barnes took over, after being hired to teach method courses, and directed the program (Hurley, 1998).

In the year 2000, a US Department of Education effort to improve post-secondary education provided grant money to establish 13 university-based String Projects. The String Project at University of South Carolina served as the model for the national grants, which funded the first-year start-up costs of the majority of the early consortium sites (Byo & Cassidy, 2005). The National String Project Consortium (NSPC) is a non-profit

independent organization that serves as a coalition for the String Projects across the United States. The NSPC was founded in 1998 by collaborative effort of The American String Teachers Association (ASTA) and the National School Orchestra Association (NSOA). Today, there are 40 String Projects across the United States and the number of String Projects is expanding every year. The NSPC works in collaboration with ASTA and other music organizations, promoting string music education in the United States (NSPC, n.d.). Hurley (1998) described 10 of these programs that were founded prior to the NSPC (see Chapter 2 for details).

Research Related to String Projects

According to the National String Project Consortium (NSPC) website, String Projects serve two purposes: to offer a high-quality affordable string education to students between 2nd and 12th grades, as well as providing hands-on teaching experience to college students who are interested in learning and honing their string teaching skills as well as handling other teaching-related routines. Experienced mentor teachers (master teachers) supervise the college student teachers and serve as teaching models.

Additionally, mentor teachers help younger preservice teachers acquire the necessary knowledge for lesson planning, preparation, teaching, and improving their string teaching skills. In addition to string music education students, String Projects also attract college students from different majors, including string performance and other qualified music and non-music majors who are interested in teaching younger students. Other NSPC objectives for the String Projects include providing opportunities for pre-college students who live in school districts that have limited or no access to string

programs, and preparing them for placement in school or youth orchestras, nurturing the growth and development of existing school string programs, and providing music-making opportunities and sustaining string music programs (NSPC, n.d.).

Most String Projects provide both private and group instruction classes; however, the number of string instructors, number of children, class and lesson offerings, and schedules vary widely from one String Project site to another. Many String Projects offer beginning class instruction for those with no prior playing experience. Every year, in most sites, teams of String Project teachers visit schools to demonstrate some of the music children could learn in the program and invite them to participate in the project. Other means of recruiting students to the String Project programs across the United Stated include letters to district principals and newsletter articles. Furthermore, each university that houses a String Project program has its own website directing people how to apply and register for classes. People who decide to join a string program can attend the information and registration meeting that usually takes place one or two weeks before the classes begin (Davis, 2011).

I found four studies that researched topics related to String Projects since the inception of the NSPC to the present. Researchers have examined various topics related to String Projects, including how well the goals set forth by the National String Project Consortium are met by String Projects (Byo & Cassidy, 2005), the preparation and lesson planning of string instructors involved in String Projects (Ferguson, 2003; Schmidt, 2005), and the nature of interactions between directors, master teachers, string teachers, community students and their parents (Davis, 2011).

Byo and Cassidy (2005) surveyed String Project sites to examine how well String Project sites were meeting the National String Project Consortium goals. They found that String Projects attracted college-level string students from various majors and attracted new community students. Current community students expressed the desire to sign up for more classes in the future and would recommend the String Project to other students. Schmidt (2005) investigated the lesson planning process of string student teachers involved in a String Project. She found that student string teachers expressed difficulties planning for lessons and identifying the learning needs of their students, demonstrated limited transfer of their in-class university experience to the String Project, and experienced difficulty drawing a connection between their teaching delivery and students' learning difficulties.

Ferguson (2003) investigated the relationship between String Project teachers' understandings of themselves and their experiences working at a String Project. Ferguson found that preservice teachers working at a String Project brought their own teaching ideologies that stemmed from previous experiences and understandings to their teaching at a university String Project. Some of these preservice teachers expressed their concerns about certain aspects of teaching and indicated that their involvement in a String Project helped them overcome these concerns.

Through qualitative case-study, Davis (2011) examined the USC String Project (USCSP) to provide a multi-dimensional perspective of the interactions within the USC String Project. She found that the USCSP helped nurture the personal growth of the preservice teachers, and offered hands-on teaching experiences and invaluable feedback

from experienced teachers. Additionally, community students indicated having a positive learning experience at USCSP. These positive experiences generated the desire within some of these community students to pursue music teaching from an early stage of their life, Davis' findings suggested.

Researcher Background

I am approaching this research from two perspectives: as a classically trained musician and as a string educator. I am always exploring new ways and teaching methods to enhance my teaching and adding new ideas to my teaching arsenal. I have also taught violin and viola private lessons for more than ten years, with an additional three years of teaching string ensemble at high school level and one year at college level before deciding to pursue graduate degrees in music education as an international violinist and string educator. My performance and educational background have contributed to the richness of this study.

I was made aware of the String Project program at Arizona State University in 2014 when I started my doctoral studies. As a string teacher, I was intrigued to learn more about the program and what it has to offer to both string teachers and students. I decided to join the String Project at ASU as a teacher for group classes, driven by my curiosity to learn what this program offered to those who would fill string teaching positions. During my four years of study at ASU, I taught three classes that met once every Saturday and a few private lessons. I taught everything from beginners to advanced students. These four years of teaching at the String Project helped me hone my teaching and communication skills. Working with master teachers and fellow student instructors

whose primary instruments were different than mine provided an invaluable wealth of information on how to deal with various performance and teaching problems.

My four years teaching at the String Project made me realize that these programs are a wonderful opportunity for those seeking positions teaching strings, as they provide an early authentic teaching experience for the preservice string teachers. Furthermore, String Project teaching helps bridge the gap between the propositional knowledge that string education students acquire in method courses, and the procedural knowledge acquired during student teaching. Through my involvement in the String Project as an instructor, I found that the undergraduate and graduate string teachers who teach at the String Project are not only offered hands-on teaching experiences and opportunities to observe experienced string teachers but are also provided feedback about their performance as teachers.

Definitions

The current study examines teachers' perspectives of teachers' skills and behaviors important for music teaching. This study is based on Teachout's 40-item survey pertaining to the important skills and behaviors for teaching music. Teachout's study has been adapted by others (Davis, 2006; Edelman, 2016; MacLeod & Walter, 2011; Miksza Biggs, & Roeder, 2010; Moss, 2007). The studies did not use common definitions of skills and behaviors. I begin this section by discussing these different definitions, and then define the terms as used in this study.

For the purpose of this study, I am choosing to define "teachers' skills and behaviors" as everything that teachers do, say or imply during the class or lesson time.

This involves all the verbal and nonverbal communication and gestures that take place between the teacher and the student. Teachout (1997), categorized these skills and behaviors into three broad categories: personal skills and behaviors, teaching skills and behaviors, and musical skills and behaviors. Other studies based on Teachout's survey also utilized the same designations (Davis, 2006, Edelman, 2016; MacLeod & Walter, 2011; Miksza, Roeder, & Biggs, 2010; Moss, 2007). However, it is not clear how Teachout decided on the designation of the 40 statements pertaining to skills and behaviors in his survey.

Teachout generated the 40-item list of the most important skills and behaviors from three sources. He first sent an open-ended questionnaire to preservice teachers at three universities and asked them to list important skills and behaviors. He then asked experienced music education faculty and teachers to list all teachers' skills and behaviors they deem important for successful music teaching, using a survey containing open-ended questions, and verified the skills and behaviors with the existing literature, and also with five expert music teachers who had 10 or more years of teaching experience in public schools. Teachout selected the top 20 items from the list of experienced music teachers and the top 20 items from the preservice teachers, making sure not to duplicate any of the items from both lists. Following the construction of 40 statements of teachers' skills and behaviors, he then designated each item on the list to one of three broad categories of skills and behaviors; personal, teaching, and musical skills and behaviors.

To determine the rank order of each of the 40 skills and behaviors statements for both experienced and preservice teachers, Teachout determined the two group means for

each category, and constructed a ranking list for each participant group. In addition to the ranking lists, Teachout also sought to understand which of the three broad categories of skills and behaviors each group of participants deemed most important. He conducted a two-way repeated measure ANOVA as an ex post facto procedure with two predictor variables: teaching experience with two levels (preservice and experienced teachers), and the three skills and behaviors categories with three levels (personal, teaching, and musical skills and behaviors). He found statistically significant differences between the preservice and experienced teachers, and between the three broad categories of skills and behaviors.

Edelman (2016) utilized Teachout's 40-item survey to examine the skills and behaviors that music teachers deem important. After making some necessary adjustments to Teachout's original list of skills and behaviors statements to match the context of his research criteria, Edelman conducted a face validity procedure. He asked a panel of music education experts to assign each of the 40 statements to one of the three broad categories of personal, teaching, or musical skills and behaviors using an electronic form that he administered to the panel of experts. He then analyzed the data from the panel of experts to determine how the panel of experts agreed on the designation of each statement to one of the three broad categories listed in Teachout's original study. Edelman found that the panel of music education experts designated 13 items differently than Teachout's original survey. However, the panel then discussed and agreed on all 40 items on the list. However, after the discussion of the panel of experts, Edelman still reported five skills and behaviors different from Teachout's original study. This may be indicative of a crossover effect in meaning between the 40 statements, because each statement can be

interpreted and designated differently to one of the three categories of skills and behaviors. This will be discussed in more detail in chapter 4 and five of the current study.

Defining the personal skills and behaviors category was more challenging than defining the musical and teaching skills and behaviors. I found various perspectives of what personal skills and behaviors are in previous studies. Hamann et al. (1998) suggested that social intelligence has three components: social expressivity, which is the individual's non-verbal communication ability to convey emotional attitude and states, as well as sending non-verbal expressions of attitude; social sensitivity, which is the individual's ability to receive and interpret non-verbal communication from others and produce an appropriate response; and social control, which is the individual's ability to guide the direction and content of communication in social interactions.

Skills and behaviors. For the purpose of this study, I define "skills and behaviors of teachers" as everything that teachers do, say or imply during the class or lesson time. I developed my own definitions of the sub-categories after reviewing several definitions that I found in previous studies.

Musical skills and behaviors. Encompass all actions, understandings, and applications of knowledge directly related to creating, composing, conducting, and performing music in any musical context or setting.

Teaching skills and behaviors. Are actions, understandings, and applications of knowledge directly related to instructional techniques, teaching delivery, verbal and non-verbal communication, student discipline, classroom management, rehearsal time management, and other behaviors occurring during a music lesson or rehearsal.

Personal skills and behaviors. Are the individual's capacity to communicate and accurately decode information received from others and use this information to interact in an appropriate manner. These social skills and behaviors are constantly changing and evolving. I derived this definition from both Goleman's (2006) *Emotional Intelligence: Why it matters more than IQ,* and Hamann et al. (1998).

The participants for this study are those who are currently involved in String Projects as directors, master teachers, and string instructors.

Master teacher. Refers to the experienced string teachers who serve as models for the student String Project instructors and support their teaching performance before, during, and after the class or lesson (NSPC, n.d.).

String Project teachers. Are undergraduate or graduate student instructors who teach strings in group settings or private lessons. These string instructors vary in their teaching experience and academic majors.

String Project directors. Are in charge of running and managing a String Project. Some directors also serve double duty, as directors and/or master teachers.

Chapter Two

Literature Review

The purpose of the study is to investigate the perspectives of directors, master teachers, and student teachers involved in String Projects regarding the skills and behaviors important for teaching in the String Project. This chapter is presented in three main sections. The first section discusses studies that examined the history and objectives of String Projects and string teaching. The second section summarizes studies that looked at various aspects of String Projects. The third section reviews studies related to the perceptions of teachers' skills, characteristics, and behaviors deemed important for teaching music. Section three is organized into three sub-sections: a) studies that compared experienced, novice, and preservice teachers' perspectives of the skills and behaviors important for successful music teaching, b) studies that examined experienced teachers' and directors' perspectives of the skills, characteristics, and behaviors important for successful music teaching, c) studies that examined the perspectives of preservice teachers, novice teachers, and school students about the traits, teaching skills, and behaviors important for music teaching.

History and Objectives of String Projects

This section will provide an overview of the studies that dealt with the history and objectives of String Projects from 1977 to present. The history of the mother String Project, University of Texas at Austin String Project, is discussed in detail in chapter one. In his article "String Project success stories: Lessons to be learned," Hurley (1998) provided an overview of how early String Projects were run and where did they receive

financial support before the establishment of the National String Project Consortium. He discussed 10 string programs across the United States that were similar to what became the members of the String Project Consortium, including University of South Carolina, University of Missouri in Columbia, University of Northern Colorado, Eastman School of Music, University of Wisconsin in La Crosse, Florida State University, Ball State University, Northwestern University, University of Florida in Gainesville, and the Ohio State University.

In 1977, The Missouri String Project was founded at the University of Missouri in Columbia (UMC) by former viola professor Carolyn Kennison. Kennison attended the University of Texas (UT) and worked at the University of Texas String Project. Her goal at UMC, like the UT String Project, was to provide affordable, quality string instruction for the Columbia area. Another objective for establishing the Missouri String Project was to provide a hands-on teaching experience for music education students. The music education students attended two pedagogy seminar weekly classes. In addition, they taught homogenous classes of three to seven students twice a week, led by a head teacher and an assistant. Hurley indicated that the UMC String Project was self-supporting financially.

In 1981, University of Northern Colorado (UNC) followed suit and established their first String Project program. The program was founded by Donald Hamann, who served as a UNC String Project teacher for nine years. The UNC String Project program provided private string instruction as well as orchestral preparation classes in four levels. In addition to violin, viola, cello, and bass, the program also provided instruction for harp

and guitar. Aside from orchestra classes, the UNC String Project also offered music theory and history classes taught by music education faculty and string majors from UNC.

The UNC String Project also offered various other learning and performance opportunities to their students, including masterclasses, play-ins sessions, and guest artist-teachers. The guest artist-teachers provided yet another learning and observation opportunity for college students. Furthermore, college students who participated in the String Project also took pedagogy classes taught by faculty member Greg Hurley to further discuss and guide their teaching. The faculty of the UNC String Project set fees for the lessons, paid directly by the parents.

The Eastman School of Music collaborated with the Rochester City School District to improve music instruction in the school district. This collaboration resulted in a string program called Time for Bows, founded in 1997 by Louis Bergonzi, professor of music education at Eastman School of music and, at the time, national president of the American String Teachers Association (ASTA) president. The program took place at Enrico Fermi Public School, a school where the majority of the students lived below the federal poverty line. The program provided string instruction to third graders in violin, viola, cello, and bass.

In the school year 1998-99, the program expanded to include a new group of third graders and beginner adults who agreed to play with the students. The program also recruited two doctoral fellows to teach in the program. Group instruction was provided by string education majors and faculty, while private lessons were provided by the applied

string pedagogy majors. Additionally, The Ying Quartet, an artist residency program, offered the children opportunities to experience music in multi-dimensional ways.

The Rochester School District provided facilities and equipment, while the financial support for the program came from grants. The grants were used to purchase instruments, and the instruments were rented to the parents for $25 a year.

In October 1997, the University of Wisconsin in La Crosse (UWLC) established its first String Project program at Hamilton Elementary School. The program offered instruction for violin, viola, and cello. Seven (UWLC) students were involved in the first year of the program. The string specialist for Hamilton Public School, Kathryn Dressler, was behind the idea. Like Enrico Fermi Public School, the majority of the racially diverse students at Hamilton came from low-SES families and were eligible for free or reduced lunch. The program was initially founded as an effort to determine whether a community music program such as the String Project could generate a positive effect on students' academic performance, attitude, and self-esteem. Emily Johnson from the Educational Psychology department at UWLC examined these variables through conducting pre-tests and post-tests.

UWLC college students taught fourth and fifth-grade elementary students private lessons, small group, and large group experiences. The university students who taught the private lessons and group instruction met with Dressler on a regular basis to discuss the curriculum and teaching procedures for the program. The La Crosse Community Foundation provided the financial support through grants. The grants were used to buy uniforms for the pre-college students, pay the university students $6 an hour, pay a small

stipend for Johnson's research, and pay Dressler for coordinating the program. The grants were also used to provide transportation for the elementary students to attend concerts and other enrichment events.

In 1995, Michael Allen, faculty of music education at Florida State University (FSU), was appointed director of the Tallahassee Symphony Youth Orchestra. The youth orchestra provided quality string instruction to 150 string students from the Tallahassee community, whose ages ranged from 6 to 18 years old. These students came from public schools where there were no string programs, home schooled students, and students from public schools who received string instruction, but wanted additional opportunities to engage in music. Allen soon realized that only a small number of string education students at FSU were engaged with the youth orchestra. The Tallahassee Symphony Orchestra Board decided to engage university string education students in an effort both to benefit the string education students and to generate interest among the young instrumentalists.

Fifteen string education students joined the orchestra in the first year of the program, providing string coaching, running sectionals and performing with the orchestra. This triggered the interest of the local string students involved in the Tallahassee Symphony Youth Orchestra and raised the performance level of the orchestra to a respectable level.

The program included four groups: Primos, Symphonic Strings, Philharmonia, and Seniors. The Primos group was a beginning string class that received a group instruction once a week, in addition to half hour individual lessons during the week. This

group instruction for the Primos was taught by Terice Allen, a professional string player, assisted by an undergraduate string education major, while other undergraduate string education students taught the private lessons.

Symphonic Strings included students who had one year of string instruction. Graduate string education students FSU taught the group, in addition to sectionals conducted by the undergraduate string education students. The Symphonic Strings met once a week for a one hour rehearsal and a 30-minute sectional. Philharmonia included intermediate string students. This group met once a week for a 90-minute rehearsal and 30-minute sectional. Joining the Philharmonia group required an audition. The Seniors group consisted of advanced strings, woodwinds, brass, and percussion students. Like the Philharmonia group, the Seniors also met once a week for a 90-minute rehearsal and 30-minute sectional. This group was conducted by Michael Allen and various string education students.

In addition to these four groups, The Tallahassee Symphony Youth Orchestras also provided a folk music class called Tallahassee Fiddlers, which was offered to all TSYO students who had one or more years of instruction. The Tallahassee Fiddlers group met once a week for a 45-minute rehearsal. Undergraduates also performed with the group. The Tallahassee Youth Orchestra paid the string education teachers who taught the classes and private lessons. In addition to teaching the orchestra and private lessons, the string education teachers also attended a class titled String Education Laboratory, which they were allowed to repeat up to four times.

At Ball State University (BSU), Margaret Berg, a professor of music education, formed the first String Project program. The program was the result of a collaborative relationship between Muncie Youth Orchestra and BSU in an effort to provide additional string and full orchestra performance opportunities for the string students in Muncie Public Schools. The program offered three levels of orchestras, including, Debut Orchestra, String Sinfonietta, and the Youth Symphony Orchestra. The Debut Orchestra was a beginner level orchestra, made available for elementary students. String Sinfonietta was an intermediate orchestra, while the Youth Symphony Orchestra provided a full orchestra experience for advanced instrumentalists. BSU string students assisted with performances and ran sectionals.

In time, a closer collaboration was formed between the Youth Orchestra and the BSU string education program. The expansion of the program included enrolling the BSU students in a course called "Orchestra Literature." The course was designed to focus on public school string and full orchestra repertoire. During the course, the string students were expected to complete a comprehensive musicianship project preparing them for conducting, assessing, and supporting the educational goals of the National Music Standards. The program was financially supported by private contributions and student fees, while BSU provided the music and performance facilities.

A similar program, called the String Division, provided string performance opportunities at the Music Academy at Northwestern University (NU). The program had remained inactive for a period of time before it was reactivated in 1995. Like other String Project programs discussed earlier, the String Division at NU provided both private and

group string instruction in violin, viola, and cello to elementary and middle school students. The program was taught by Northwestern string students. As part of the program, the string performance bachelor and master's degree students enrolled in pedagogy classes. James Kjelland, coordinator of string pedagogy, taught some of the pedagogy classes and acted as the link between the School of Music and the String Division program, while Stacia Spencer taught various levels of violin and viola pedagogy classes and coordinated the String Division program. Financial support for the program came from lesson fees, while Northwestern University provided the facilities and administrative support. String students who taught at the String Division were offered a tuition reduction for their teaching.

In 1994, University of Florida in Gainesville (UFG) established its String Project program. The program was founded by Camille Smith in an effort to provide string instruction for students ages 7 and 17. The program offered seminars in pedagogy and weekly private and group hands-on teaching experience for the UFG string students. In addition to the pedagogy seminars and hands-on teaching experience, the program also provided opportunities for conducting full orchestra and leading sectionals for the undergraduate students.

The program offered two levels of group instruction. Students with two years or more of playing experience were eligible to take part in the Petite String Orchestra. The class met once a week in the evening. The intermediate to advanced orchestra class was called Chamber Strings, and was available to string students by audition. The class met for 90 minutes weekly. The financial support for the program came from lesson and class

fees ranging from $50-95 for the classes, and $150 for the private lessons per semester. The undergraduates who taught the String Project program earned between $550 and $1800 per semester. The group classes utilized a combination of Suzuki pedagogy and public-school string teaching methods.

In an effort to provide quality string instruction to pre-college students, the Ohio State University (OSU) collaborated with the Columbus Symphony Orchestra, to form the Columbus Symphony Junior Strings. The students in the program came from area schools and were involved in one of the three youth orchestras offered in the program. OSU students involved in the program were offered independent study credits for their first two years in the program. Most of these early String Project programs were self-supported financially. Some programs received funding through grants and private donations. These programs offered quality string instruction to community students from school districts with limited or no music programs, home-schooled students, as well as students who come from school districts that offered music programs but who wanted additional performing opportunities. These programs offered string and orchestra experience in various levels, catering to a wide range of student playing experiences.

In addition to offering quality string instruction and performing opportunities to pre-college students, these programs also provided authentic hands-on teaching experiences to college-level and graduate students. Undergraduate and graduate students benefited not only from the invaluable teaching experiences, but also depending on the location, from pedagogy classes, workshops, self-reflection about their own teaching performance, and working with experienced teachers. These various teaching and

learning opportunities provided by String Projects resemble the core objectives of the National String Projects Consortium. These programs followed the String Project at University of Texas at Austin, the original String Project program, established in 1948, and the University of South Carolina String Project, which served as a model for other String Project programs. From 1974 to 1998, when the National String Project Consortium was established, other programs similar in objectives were founded.

Research Studies About String Projects

This section reviews studies related to some of the teaching components of String Projects. Byo and Cassidy (2005) evaluated the goals by the National String Project Consortium, while Schmidt (2005), explored the preparation and planning skills of String Project teachers. Additionally, Ferguson (2003) examined the String Project string teachers' lived experiences, while David (2011) provided an overview of the challenges and rewards encountered by the String Project students.

Byo and Cassidy (2005) attempted to evaluate whether or not the goals set by the National String Project Consortium (NSPC) were accomplished by 13 String Project sites during the period 2003-2004. Four research questions were generated to guide this study including, "1) To what extent are string education majors attracted to the String Project and subsequently electing to teach strings/orchestra in the schools? (2) To what extent are student teachers provided opportunities to teach in authentic settings under the supervision of qualified master teachers? (3) To what extent does 'affordable' music instruction attract a critical mass of community children, and what characteristics do they bring to the program that shape the experiences of student teachers? (4) What effect does

the String Project seem to have on the attitudes of student teachers, community children, and parents toward string music education?" (p. 335).

Byo and Cassidy sent out a total of surveys to 1,458 project directors, master teachers, student teachers, community children, and parents of children in the 13 String Project sites. The researchers adapted the surveys from previous studies done by Gunn (2003) and Duke, Flowers, and Wolfe (1997). Byo and Cassidy (2005) used six criteria developed by the American String Teachers Association (ASTA) to evaluate the extent to which these 13 String Projects implemented the USC String Project model.

In addition to the surveys, the researchers conducted interviews with each one of the project directors and mentor teachers, lasting between 45–75 minutes each. Project directors provided information related to the background and structure of their string project, number of student teachers, community students, and budget of the project. Mentor teachers provided information about student teachers, String Project curriculum, personal qualifications, and attitude of student teachers.

The results of the study showed that 71% of the student teachers indicated that they were in pursuit of a music education degree and 80% of the student teachers stated that they will be teaching in schools. Additionally, the results of the study showed that student teachers spent one third of their time participating, half of their time teaching, and less than a third of their time observing. Using a Likert-type scale, the majority of the student teachers indicated that teaching small groups and one-on-one, interacting with fellow teachers and community students, and feedback from mentor teachers were of

high value to them. The results also indicated that generally, the student teachers showed positive attitudes towards the String Project.

Moreover, community students also indicated a positive attitude towards the String Project (99%), would recommend the String Project to other students (99%), and would sign up for more classes in the future (86%). The results also showed that 24% of parents indicated that their children participated in string instruction at school. Parents and students were in agreement that students practiced for 30 minutes from 0 to 4 times a week. When asked whether or not parents help their children practice, 18% said never, 45% said sometimes, and 11% indicated that they always help their children practice.

Byo and Cassidy concluded that children who attended the String Project are more likely to pursue music teaching as a career when music teachers demonstrate love and passion for teaching, create a positive learning environment, and provide their students with opportunities to teach and conduct. Student teachers highly valued feedback from mentor teachers, which is indicative of the importance of mentorship and supervision to pre-service teachers. Parents indicated that String Project fees were indeed affordable. Byo and Cassidy suggested that the USC String Project model be implemented in other settings and with different financial agreements.

Schmidt (2005) investigated lesson planning of pre-service string teachers working in a university String Project. She conducted an exploratory year-long qualitative study investigating the development of teacher expertise, the role of teaching experience, and the experience-based beliefs of pre-service string music teachers. Three research questions guided her study: a) What are the initial understandings of pre-service

teachers about planning for class and private lesson instruction? b) “What patterns are evident in in their planning for class and private lesson instruction?” (p. 8), and c) How do pre-service teachers apply the knowledge acquired during string technique class in their planning for class and private lesson instruction?

Schmidt recruited 10 freshmen and sophomore String Project String Teachers. Among those 10 pre-service teachers were 7 music education majors, 2 music performance majors, and 1 music therapy major. At the time of the study, 6 of the 10 student teachers were enrolled in a string technique class and an introduction to music education class. Both classes offered an opportunity to write one lesson plan and teach it to their classmates. All of the participants taught four to six private lessons a week. Additionally, seven out of the ten taught a group class twice a week. The classes consisted of 10 to 15 fifth- and sixth-grade students. The music used for the classes was either in unison or two-part pieces. This eliminated the need to rehearse multiple parts. At the end of each semester, the teachers were responsible for preparing their private students for an end of semester recital, and those who taught the classes twice a week were responsible for preparing their students for a concert.

Data included field notes, audio recording of discussions following each observation, interview transcriptions, and written lesson plans. Schmidt conducted and video recorded observations every two weeks. She reported difficulty in convincing the student teachers to write lesson plans for their classes and private instruction. A few students kept written lessons plans which were only sketches of what they intended to do during the lesson. Schmidt then adjusted her research questions to develop a better

understanding of the student teachers' planning processes using any written records that they produced, combined with her observations, and her understanding of their planning processes through conversation. Other changes to the research questions included comparing the teaching of music education majors with that of performance and music therapy majors, as well as comparing the teaching of those who had taken the string techniques and introduction to music education courses with those who did not.

Schmidt found emerging themes after analyzing the collected data: 1) concerns about knowing how to begin to plan, 2) difficulty identifying what the children needed to learn, 3) the prominence of decisions made on the fly, 4) comparison between teachers' teaching and planning and their actual written lesson plans, and 5) limited transfer of their in-class experience to their teaching at the String Project.

Schmidt found that some teachers who taught the one-on-one lessons understood planning as the ability to find music appropriate for the needs of their students. Some other teachers questioned whether or not they were doing the "right" thing in their private lessons and classes, and some of them sought help from either a mentor teacher or the researcher herself.

Schmidt also reported that the teachers experienced difficulty identifying the learning needs of the children. Some of the teachers were unable to draw connections between their delivery of information and the children's difficulty to understand, and they translated their frustration with their students as students' inability to learn. Schmidt also found that some teachers demonstrated the ability to set specific objectives for their students' learning, as evidenced in their written plans and demonstrated during the lesson.

The results of the study also showed that regardless of whether or not these teachers wrote detailed lesson plans or just simple sketches, it was evident that teachers had set specific strategies to achieve particular learning goals. Furthermore, the six teachers who had taken music education courses were unable to recall and apply in their teaching what they learned about lesson planning in the classes. To her surprise, Schmidt reported that regardless of her continuous efforts throughout this yearlong study to encourage the teachers to keep written records of their lesson, the teachers did not seem to develop written lesson planning skills.

Schmidt concluded that some of the participating teachers thought that planning instruction was unnecessary, and they relied on their ability to respond to whatever their students presented. Schmidt also indicated that the participating teachers' lesson-planning ability was limited to their knowledge bases including content knowledge, general pedagogical knowledge, and pedagogical content knowledge. Also, data analysis suggested various intuitive abilities in thinking and planning for teaching among the teachers.

Through a qualitative ethnographic multiple-case study, Ferguson (2003) explored the relationship between preservice teachers' experiences working in a String Project and their understandings and individualized perceptions of themselves as teachers. She formulated two research questions to guide her study: a) How do undergraduates view their experience in the String Project? and b) What understandings do undergraduates gain from their experience teaching in the String Project? Four undergraduate students who worked as teaching assistants in the String Project served as

the primary participants for this study. Secondary participants included three other undergraduate students who taught small group lessons, and a graduate assistant who handled the administrative work and taught bass lessons.

Ferguson collected multiple forms of data, including interviews, field notes, artifacts, and attendance at orientation and weekly meetings. She conducted two personal interviews with each of the primary and secondary participants using structured and unstructured formats. Ferguson audio-recorded the interviews and informal conversations with the participants. The collected artifacts included email correspondence, letters, administrative documents such as student lists and schedules, as well as articles published in state music education newsletters. The data analysis process consisted of organizing, transcribing field notes, and labeling interviews for interpretations.

Ferguson found that the undergraduates involved in the String Project brought their own worldviews and ideas, based on previous experiences and knowledge, to their teaching environment at the String Project. These perspectives and ideas influenced their reactions to the teaching and learning process in both group and private lesson teaching situations. The undergraduate participants also constructed individualized views of themselves as teachers. Some of the participants expressed their concerns regarding their teaching and their ability to lead classes. The undergraduates emphasized the importance of feedback and guidance they received from the experienced teachers and the director of the program and spoke positively about the feedback they received on lesson-planning. Furthermore, Ferguson indicated that the preservice teachers applied various previous teaching and musical experiences and understandings to their teaching at the String

Project and incorporated their previous knowledge and understandings with what they learned at the String Project.

Davis (2011) conducted a qualitative single-case study. The purpose of this study was to describe the nature of interactions within the University of South Carolina String Project (USCSP), and explore the benefits and challenges that community students, faculty and institution experienced during the period from 2009 to 2010. She generated three research questions to guide this investigation: 1) What are the experiences of USCSP community students, faculty, and the institution? 2) How do student teachers, faculty, and institution benefit from the USCSP? 3) In what ways does the String Project at USC challenge the student teachers, faculty, community students, and institution?

To address the needs of each group of participants, Davis utilized different interview protocols for each group. For example, some of the questions used for the student teachers protocol were a) What are the preparation and planning requirements to teach at USCSP? b) Describe the relationship between you and the community? and c) In what way your experience teaching at the USCSP challenged you?

In addition to the interview protocols, Davis also conducted several extensive field observations over the course of 14 months to establish rapport and to develop a better understanding of the nature of the deep structure of knowledge within USCSP participants. Davis also examined the pedagogical practices at USCSP, including method books, instrument playing techniques, teaching style, and the structure of the String Project. Other data gathering tools used in this study included videotapes, audio recordings, and reflective journal entries from several student teachers.

Davis utilized Veblen's (2004) definition for "community music practices" to identify USCSP as a community music program. She described these practices as active music making, having lifelong learning goals for the participants, and serving individuals from different backgrounds. She defined "faculty" as the body of professors and graduate teaching assistants who served as mentors to the student teachers, and used the term "institution" to represent the USC as an educational institution. Davis (2011) used a purposeful sampling method to invite the participation of student teachers, faculty, and community members including both students and parents, ensuring that she learned multiple perspectives about USCSP.

Davis found that USC's institutional commitment in supporting cultural community outreach as seen throughout the campus was evident. The campus served as a hub for community music engagement programs, including The Children's Music Development Center, the Congaree New Horizons Band, as well as vocal and instrumental private instruction, and the USCSP. The findings suggested that the USCSP faculty and USC institution members demonstrated awareness of the university mission and strived to constantly improve undergraduates' teaching skills by providing an effective and flexible learning environment in the String Project.

Davis also found that some of the student teachers expressed a desire to teach from an early stage of their life. This desire stemmed from positive experiences with people who attended the USC School of Music, public school teachers, or private teachers who went to USC. A few student teachers indicated that they were former community students at the String Project prior to entering the university. The researcher

also found that critical reflections were a prominent element in helping these String Project teachers develop a better understanding of how they teach, helping them to become more reflective in their teaching. The USCSP student teachers indicated that participating in the USCSP program helped nurture their personal growth to learn new skills and helped them to have a hands-on teaching experience which they believed would help them later in their career. These undergraduate students indicated through the interviews that they could not imagine getting into the teaching field without going through the USCSP program.

Davis found that the student teachers came from diverse backgrounds. The dean of the USC School of Music said in an interview, "None of what we do is as diverse as the String Project" (p. 142). USCSP encouraged adults to participate in the classes, and in 2004 the USCSP started offering beginner classes for adult students. These adults were then integrated into the younger student classes. The affordable fees made high-quality string instruction accessible to all community members from the Columbia region. The community members pointed out that music learning was one of the benefits of joining the String Project. Also, Davis found that the community students' musical knowledge expanded, and their views of self shifted. They started adopting more musical vocabulary as they advanced in the program, and they were able to transfer their understanding of that vocabulary into their performance.

The participants indicated that alongside the benefits of the USCSP program, they also encountered challenges. Davis categorized these challenges into four types: time commitment, musical challenges, teaching challenges, and personal challenges. Some

student teachers reported that time commitment was one of the challenges, because it not only involved the time and effort spent during their participation in the program, but also the time commitment of their course work, which made their daily schedule very busy. Other students reported musical challenges with participating in the USCSP, as those teaching private lessons on secondary instrument felt less secure. In addition to the musical and time commitment challenges, some student teachers reported concerns with teaching challenges, including classroom management, effectiveness, and preparation and planning for teaching. One student also reported a personal challenge of separating her personal life and emotions from her professional life as teacher.

Davis concluded that all participants valued the opportunities that USCSP program offered. They also expressed their enjoyment with the success of the program. Like any other program that involves teaching and learning, participation brought benefits and challenges to all involved. The undergraduates indicated that the program definitely helped them gain valuable teaching experience, through participating in a safe and positive learning environment, and also fostered their personal growth. Faculty reported their mission as helping pre-service teachers become better teachers and preparing them for their professional life as teachers.

I found only four studies that examined String Projects. These studies examined the objectives of String Project programs, the educational value for both college-level string teachers and pre-college students, the challenges and benefits of running a String Project program, and the challenges and benefits that college-level string teachers experience and their worldviews they brought to their teaching. All of these studies found

that String Project teachers valued opportunities for teaching as well as the feedback they received from their mentor teachers. Schmidt (2005) found that some pre-service students believed that any written preparation of teaching is unnecessary, while others used brief written sketches of what they intend to do during the class. Others made notes of the pedagogical goals they wanted to achieve with their students. Ferguson (2003) investigated preservice teachers' experiences working in a String Project and their understandings and individualized perception of themselves as teachers and found that preservice music teachers their worldviews that stem from previous experiences and understandings and incorporated them into their teaching. Preservice teachers also indicated that feedback from experienced teachers was invaluable for their growth as teachers.

Furthermore, Byo and Cassidy (2005) attempted to evaluate whether or not the criteria set by the National String Project Consortium are achieved in String Project university sites and found that a significant number of pre-service expressed their intentions to be school music teachers. They also found that the String Projects were successful in attracting string education majors and provided real-world hands-on teaching experiences. Davis (2011) conducted an extensive qualitative study examining the University of South Carolina String Project model. She identified several benefits and challenges associated with participating in the USCSP as well as providing a holistic picture the perspectives of those participating in the USCSP. Future research can adapt the USC String Project for different settings and different budget.

Teachers' Perspectives of Skills and Behaviors for Successful Teaching

This section is organized into three sub-sections. In the first section, I review studies that compared experienced, novice, and preservice teachers' perspectives of the skills and behaviors important for successful music teaching. Following that I discuss studies that examined experienced teachers' and directors' perspectives of the skills, characteristics, and behaviors important for successful music teaching. Third, I summarize studies that examined preservice teachers', novice teachers', and school students' perspectives of the traits, teaching skills, and behaviors important for music teaching.

Experienced, Novice, and Preservice Teachers' Perspectives

This section will discuss studies that examined and compared experienced, novice, and preservice teachers' perspectives of the skills and behaviors important for successful music teaching.

Moss (2007) examined the differences in perceptions of the most important characteristics of effective instrumental music teachers between novice and experienced teachers, as well as their perceptions of where these characteristics are acquired. Moss posed the following questions to guide her study: a) Based on their years of teaching experience, how do teachers differ in their perceptions of the most important characteristics of effective instrumental music teaching? b) Of the most important characteristics, where do teachers believe those characteristics are acquired? c) Based on their years of teaching experience, how do teachers differ in their perceptions of where the most important characteristics are acquired?

Moss utilized a survey from a previous study done by Teachout (1997). A slight modification to the original survey was necessary to suit the needs of this study, including wording adjustments that did not change the purpose of the items and substituting a new item for an already exiting one. Also, Moss assessed where the participants primarily acquired each of the 40 characteristics, offering eight choices: personal development/personality, family/friends, university teacher-training programs, student teaching, mentors, professional development, teaching experience, or other. Moss employed a 4-point Likert-type scale similar to the original study by Teachout and asked the participants to rate each of the 40 statements, with 4 being extremely important and 1 being somewhat important.

The survey was piloted by experienced and novice teachers prior to sending it out to the participating teachers, and the feedback from the pilot study was used to adjust wording and format of the final survey. However, Moss did not report the reliability of the modified survey. The study participants consisted of elementary, junior high school, and high school orchestra and band teachers identified through the Washington Music Educators' Association website. Moss identified 987 potential participants and invited their participation via email. Of the 987 potential participants, 266 completed an electronic survey (24.7%). Teachers with five years or less of teaching experience were considered novice teachers and those with more than six years of teaching experience were considered experienced teachers. Moss sent an email invitation to the participants and included a hyperlink to the electronic survey. She allowed the participants three and a half weeks to complete the survey.

Moss utilized descriptive statistics to analyze most of the data on the survey. For the analysis of the 40 items, she calculated the mean for each item and ranked them based on their importance for the participants.

The results of the study indicated that, of the top 10 ranked characteristics, 8 of the 40 characteristics in the survey were common in both novice and experienced teachers' groups: "be able to motivate students," "be flexible and adaptable," "be patient," "employ a positive approach," "maintain excellent classroom management and procedures," "maintain student behavior (strong, but fair discipline)," "display confidence," and "maintain high musical standards." Additionally, novice teachers ranked "involve students in the learning process," "use effective nonverbal communication," and "manage stress well" higher by ten or more rankings than the experienced teachers.

Moreover, experienced and novice teachers ranked 18 of the 40 items on the survey equally or within one ranking order of each other, with "be able to motivate students" and "be flexible and adaptable" ranked in the top 2 for both groups, while "display confidence," "maintain a high level of professionalism," and "frequent eye contact" were ranked between eight and 15 among both groups. Furthermore, the items "knowledgeable of subject matter materials" and "competent conducting gestures" were ranked 29th and 33rd respectively by both groups. The top ranked items among both experienced and novice teachers included 6 personal skills, 6 teaching skills, and only one musical skill ("maintain high musical standards"). These findings are consistent with Teachout's (1997) and others' findings.

In addition to the ranking questions, Moss also asked where participants believed these characteristics were acquired. Both groups ranked "personal development," "teacher training," and teaching experience," the highest as places for skills and characteristics acquisition, while both ranked "family/friends," "student teaching," and "professional development" lowest.

Moss concluded that musical and teaching characteristics are commonly discussed in music teacher training programs, while the personal traits included in the survey are rarely discussed. This study and several previous studies, however, indicated that teachers believe that teacher' personal traits are essential for effective teaching. One of the limitations of Moss' study is the huge difference in number of participants in each group, with 30 novice teachers and 236 experienced teachers. Moss suggested that any generalization of the outcomes of this study should be handled with caution, as a fairly small number of novice teachers participated.

Davis (2006) also adapted Teachout's (1997) 40-item survey in a descriptive study, comparing the beliefs of beginning music education students in their first music education course of their program with those of student teachers, regarding the skills that could lead to initial success in teaching music. The subjects for this study consisted of 55 beginning undergraduate music education majors enrolled over three semesters in an introduction to music education course, and 25 music student teachers enrolled in the university over three semesters who were halfway through their student teaching assignment. The researcher administered the 40-item survey adapted from Teachout (1997) to both groups, asking them to rate each statement using a 4-point Likert-type

scale, indicating its importance during their teaching. Although Davis indicated using Teachout's survey, she did not report the reliability of the survey used in her study.

Davis calculated the means for each of the 40 statements for both groups and ranked them from highest to lowest to determine whether or not differences existed in perspective regarding the importance of the skills and behaviors contained in the survey. Furthermore, Davis conducted a *t*-test for each of the items to determine if there existed differences between the two groups of participants on each question. Teachout (1997) assigned each one of the 40 statements into three broad categories of personal skills and behaviors, teaching skills and behaviors, and music skills; Davis used this same categorization. Davis (2006) then conducted a two-way repeated-measures ANOVA to determine whether or not differences in perspectives existed between the beginning music education students and student teachers on the three sub-scales of skills and behaviors: personal, teaching, and musical.

The results of the study indicated that 14 items had the same means, which resulted in tied ranking in several rank orders between the two groups of participants. These 14 items were in the top ten lists for both participant groups. These skills and behaviors included a) enthusiastic, energetic, b) involve students in the learning process, c) maintain student behavior, d) be knowledgeable about subject matter materials, e) frequently make eye contact with students, f) employ a positive approach, g) display confidence, h) be patient, i) be organized, j) be able to motivate students, k) possess strong leadership skills, l) be flexible and adaptable, m) be able to present a lesson with clarity, and n) manage stress well. Some of the responses from Davis' study were

common to Teachout's original study that compared preservice and experienced teachers, including possess strong leadership skills, display confidence, involve students in the learning process, be organized, motivate students, and employ a positive approach.

The two groups also ranked five items from the survey list differently. The beginning music education students ranked "maximize time on task" 19th, while student teachers ranked it 7th. Beginning students ranked "maintain a high level of professionalism" 22nd, and student teachers ranked it 9th. Beginning music education majors ranked "maintain excellent classroom management" 16th, and student teachers 1st. Both groups ranked "possess excellent sight-reading skills" low, with beginning students ranked 28th and student teachers 17th. Beginning music education students also ranked "be mature and have self-control" as number 1, while student teachers ranked it 12th. The item, "have excellent speaking skills," was ranked 13th by beginning music education students and 19th by student teachers. To determine whether or not there were statistically significant differences between the three skills and behaviors categories among the two groups of participants, Davis conducted a two-way repeated measures ANOVA. The two-way repeated-measures ANOVA showed no significant difference between the ranking of the three broad categories of skills and behaviors $F = (2, 37) = 9.84$, $p = .06$, or between the two groups $F = (1, 37) = 2.37$, $p = .13$. The results also showed no interaction between the two main effects (teaching status and the three broad categories of skills and behaviors) $F = (2, 37) = .61$, $p = .55$.

Based on ranking each of the 40 statements for both beginning music education students and student teachers, as well as conducting a two-way repeated-measures

ANOVA for the two main effects, Davis proposed several potential explanations that 14 of the skills and behaviors were ranked in common between beginning music education students and student teachers. First, teacher-education programs may place emphasis on certain teacher skills and behaviors. Second, previous experiences as music students for both groups may have also played a major role in shaping the undergraduates' way of thinking. It is also possible that the teaching ideologies of student teachers had not changed from the beginning of their teacher-education program.

Whitaker (2011) looked at high school band students' and directors' perceptions of verbal and non-verbal teaching behaviors. Whitaker employed a type 4 embedded multiple case study design, and used both quantitative and qualitative approaches. The study was done in two stages. In the first stage Whitaker asked music education professors and music supervisors to recommend names and contact information for successful high school band directors, without defining "successful." Whitaker invited six of the nominated band directors to participate in the study, ranging in teaching experience from 9-35 years.

Whitaker videotaped five rehearsals of each of the six directors teaching their top ensemble, making sure the video-taped rehearsal was representative teaching samples of the director's teaching. She then selected a total of 196 – 222 minutes from the instructional portions of each instructor's videotaped rehearsal to analyze. Whitaker analyzed their conducting gestures, body movement, eye-contact, as well as voice volume, pitch and speed of speech, using a modified version of the Music Conductor Observation Form (Madsen & Yarbrough, 1985; Yarbrough, 1975). She transcribed the

selected portions of the videotaped rehearsals for sequential patterns of instruction, time spent on each component, pattern type, and ratios of specific and non-specific feedback. Whitaker also calculated the duration and condition of each instructional pattern component and converted them to percentages. She then created a 19- to 23-minute video for each teacher, consisting of 7 to 9 selected excerpts.

In stage two, Whitaker invited all six directors and the students in their top ensemble to participate. The mean range of students' playing experience was from 5.38 to 6.09 years, and the mean of the number of years these students were enrolled in the top ensemble was 1.68 (*SD* = .79) to 2.37 (*SD* = 1.05). The students only viewed and rated teaching excerpts of their respective directors, while the directors viewed their own teaching excerpts and completed the evaluation sheet, reflecting on their own teaching.

Whitaker developed and administered The Teacher Behavior Evaluation Sheet (TBES) to all the participants. She conducted a Cronbach's Alpha reliability test for the (TBES) and reported a reliability of .84 to .97. The TBES consisted of a 10-point Likert-type scale to examine the following areas of teachers' behaviors: use of rehearsal time, pacing, presentation of information, musical information, feedback, verbal clarity, use of voice, conducting, enthusiasm, and overall teaching effectiveness. Whitaker administered an additional 22-statement questionnaire developed from lists of approval and disapproval responses developed by Madsen and Madsen (1983). The questionnaire focused on teachers' approval and disapproval statements used in the classroom, in addition to body gestures used to indicate approval or disapproval. Using a five-point Likert-type scale ranging from 0 (never) to 4 (very often), directors and their students

responded to the questionnaire. Furthermore, Whitaker also interviewed each of the six directors and five to seven of each director's students. Interviews lasted for about 60-90 minutes for each director and 20-40 minutes with the selected students.

The results of Whitaker's analysis of the directors' teaching videos indicated that band directors utilized more of the rehearsal time in academic presentation and reinforcement components (26%) than for direction, social, and off-task components (20%). The results also indicated that students' responses comprised 53%, with half of the class time devoted to students' performance, verbal (2%) and non-verbal (1%) feedback. The results also indicated that only 12% of the rehearsal time was used for reinforcement, with 79% of the reinforcement component expressing disapproval and 21% approval.

In addition to rehearsal time distribution, the sequential pattern data illustrated 80% of the patterns were completed. Sixty percent of the completed patterns were the basic pattern: (1) represents teacher task presentation (2) represents students' response, (3) represents teacher reinforcement. Simple extended patterns comprised 30%, with 10% complex extended patterns (e. g., 1-2-1-2-1-2-1-2-1-2-3). Examining the sequential teaching patterns revealed a significant difference between band directors with more experience and directors with less teaching experience. More experienced directors utilized more basic patterns throughout the rehearsal (60% of the rehearsal time) than less experienced directors (41-44% of the rehearsal time).

Whitaker used videos that showed a direct view of the directors to analyze directors' non-verbal behaviors, including body movement, conducting gestures, facial

expressions, speech speed, voice pitch, voice volume, and eye contact. Expressive gestures ranged from 27 to 51% of rehearsal time among all directors. Seventy percent of directors' facial expressions were neutral, while 14 to 27% of facial gestures expressed disapproval. Directors used variable voice pitch almost all the time and steady normal voice volume 90-95% of the time. Whitaker also found that band directors made eye contact with their music (49-71%) more often than with their groups or individuals (24-46%). On average, eye-contact of three seconds or more focused on music (49%), then on group/individuals (27%), and 2% of the time on other objects. Whitaker also found the overall frequency of instructional pacing of teacher talk/students respond and activity changes ranged from 137.5 to 297 seconds, and each activity lasted between 10.55 and 20.47 seconds. Whitaker also found that that majority of the directors spent approximately 51- 71% of the rehearsal time in movement, compared to remaining stationary.

Whitaker calculated the means for the participating students' and band directors' responses to each item on the Teacher Behavior Evaluation sheet and ranked them in order. The results of the analysis indicated that the students ranked teaching excerpts with drill-type instruction lowest. Whitaker also found that students rated teaching excerpts that contained less eye-contact lowest in four of the six band directors. Furthermore, all excerpts that received low student ratings contained neutral, negative, or lack of facial approval expressions. The results also showed that teaching excerpts that received the lowest students' ratings also contained more teacher activity than student activity.

On the other hand, teaching excerpts that received the highest students rating contained only one drill or concept, and more or equal amount of student response than teacher talk. Also, the excerpts with the highest student ratings contained both strict and expressive conducting gestures, as well as 57% or less neutral facial expressions. The results also revealed that students rated verbal and non-verbal teaching instruction very similarly.

Whitaker also analyzed the directors' perceptions of their own teaching from the Teacher Behavior Evaluation Sheet. She calculated the overall mean and standard deviation for all items. Whitaker reported a low standard deviation for the directors' responses, indicating consistency of perceptions among the directors. Generally, directors agreed with the rating of their students regarding their teachers' verbal behaviors of less teacher activity and more student performance. Some directors indicated that they strive to incorporate catch phrases and analogies in their delivery, while others indicated that they use their voice inflection to highlight or illustrate concepts.

The majority of the interviewed students indicated that they found directors' disapproval critical for their personal growth and did not view it negatively. Furthermore, students rated video excerpts that contained more students' response than teacher talk, or equal amounts of students' response and teacher talk highest, and rated excerpts with more teacher talk and less students' response lowest. On the contrary, directors rated excerpts with more or equal teacher talk than students' response highest and excerpts with more students' response and less teacher talk lowest. However, Whitaker indicated

that it was not clear how students' knowledge, preference, and ability to perform the selected repertoire influenced their ratings of their band director's teaching behavior.

Whitaker concluded that directors used a high level of body motion and spoke in variable pitch while teaching. However, there was no significant change in voice volume, facial approval or disapproval, the use of expressive conducting gestures, and eye contact during teaching. Additionally, students indicated that they take their band director's disapproving feedback as necessary criticism that helped them improve.

Heath-Reynolds (2014) examined the effect of teachers' nonverbal expressiveness on college ensemble members' and elementary students' ratings of teacher effectiveness and student learning. The purpose of this study was threefold: a) determine whether or not the level of expressiveness had any effect on participants' ratings of teacher effectiveness, lesson content, and student learning, b) determine whether or not a relationship exists between participants' ratings of teaching effectiveness and teachers' nonverbal behaviors, c) determine if there is an existing relationship between participants' ratings of teacher expressiveness and teacher enthusiasm in the elementary general music classroom.

Heath-Reynolds created three videos of a music lesson on jazz history for imaginary elementary school students, taught by one music teacher to eliminate any confounding variables. The stimulus teacher employed six non-verbal behaviors of effective teachers identified by Woolfolk and Woolfolk (1974), adapted by Heath-Reynolds: gestures, proximity, student-directed gaze, change in facial expression, vocal inflection, and smiling. In each of the video-recorded lessons, the stimulus teacher used

different levels of nonverbal behaviors from the list above to create the three videos, one each demonstrating low, medium, and high levels of non-verbal teacher expressiveness.

To ensure consistency and reliability of the amount of non-verbal teacher expressiveness in each video, a panel of four graduate students evaluated and labeled each one of the recorded videos, labeling them as showing low, medium, and high non-verbal teacher expressiveness behaviors. They used a researcher-generated rating form with evaluative statements for teacher effectiveness, non-verbal behaviors, lesson content appropriateness, and teacher demeanor, using a seven-point Likert-type scale to provide ratings of teacher effectiveness and six evaluative statements of non-verbal behavior observation. The reliability of the panel of four graduate students was 100%.

For the elementary students, Heath-Reynolds created the Student Learning Assessment form (SLA), using the National Standards for Music Education and feedback from an experienced public-school jazz teacher. The form, designed to assess student learning from the videotaped lesson, contained ten questions presented in a multiple-choice format with only one correct answer to each question. Additionally, Heath-Reynolds conducted a pilot study recruiting 43 fourth and fifth grade students to ensure that the language and questions used in the form was clear and could be answered correctly by fourth and fifth grade students. Two elementary general music specialists reviewed and agreed that the information on the SLA was consistent with the content of the scripted lessons.

For the first phase of this study, the researcher recruited 160 college students enrolled in a performance ensemble at a large university in the southeastern part of the

United States. Among the 160 participants were 59 music education students, 101 non-majors (Heath-Reynolds weren't clear about whether these are music majors or music education majors). Eleven of the participants were graduate students working on their master's degree. The participants were randomly assigned to three groups. Each one of the three groups gathered in one classroom and viewed the stimulus teaching video lesson representing one level of teacher expressiveness: high, medium, and low. They also responded to the teacher effectiveness evaluation form provided to them by the researcher, rating the teacher behaviors they observed in the video.

In the second phase, Heath-Reynolds randomly assigned 114 fourth and fifth graders in three intact elementary music classes to one of the three groups to watch the video with either high, medium, or low of nonverbal teacher expressiveness. The researcher asked the students to watch a video of a teacher talking about the history of jazz music. Following viewing the video, the elementary students responded to the questions on their SLA.

Heath-Reynolds analyzed the collected data using a one-way ANOVA. The results showed a significant difference in college-level students' responses for the three videos. A Tukey HSD multiple comparison procedure revealed that teaching with high expressiveness received the highest rating (M = 5.84, SD = 1.06), followed by the medium teacher expressiveness (M = 4.00. SD = 1.64), while the lesson with low teaching expressiveness received the lowest rating (M = 1.98, SD = 1.06). To determine whether or not there were correlations between the frequency of nonverbal behaviors on a seven-point Likert-type scale and students' rating of teacher effectiveness, Heath-

Reynolds conducted a Pearson Product-Moment Correlation. The results showed a strong positive relationship between participants' rating of teacher effectiveness and each of the six nonverbal behaviors: classroom movement ($r = .81$, $p < .001$), gesture ($r = .83$, $p < .0001$), change in vocal inflection ($r = .83$, $p < .001$), smiling ($r = .82$, $p < .001$), student-directed gaze ($r = .64$, $p < .001$), and change in facial affect ($r = .78$, $p < .001$). The results also indicated a strong positive relationship between participants' ratings for teacher effectiveness and enthusiasm ($r = .96$, $p < .001$), and between participants' ratings of teacher expressiveness and teaching effectiveness ($r = .87$, $p < .011$). The researcher found no significant difference in elementary students' learning based on teacher expressiveness, $F(2, 113) = .519$, $p = .6$.

One of the limitations that Heath-Reynolds (2014) discussed is related to the stimulus videos. In her study, Heath-Reynolds recorded three jazz history lessons taught by an experienced music teacher. The teacher presented the lesson to a hypothetical class, which prevented the teacher from engaging with the students in a traditional way, and that this may have had an influence on the participants' ratings of the teacher's expressiveness. Also, Heath-Reynolds indicated that there was no pre-test prior to administering the video and the Student Learning Assessment, therefore, students' previous knowledge of the content of the lessons was not known and not accounted for.

Experienced Teachers' and Directors' Perspectives

MacLeod and Walter (2011) examined cooperating teachers' perceptions of student teachers' level of preparedness at the beginning of the student teaching experience. The researchers invited 53 secondary music school ensemble teachers who

had supervised a student teacher in the last five years to participate in this study: 20 band teachers, 18 orchestra teachers, and 15 choir teachers.

MacLeod and Walter adapted a 40-item questionnaire designed by Teachout (1997) to measure cooperating teachers' perceptions of specific student teachers' skills and abilities in three areas: personal, teaching, and musical skills. The participants rated the level of preparedness of their most recent student teacher at the start of their student teaching experience on a 7-point Likert-type scale. However, MacLeod and Walter did not report the reliability of the survey. The participants also rated one skill that they believed was the most necessary for pre-service teachers to have from the three categories: personal skills, teaching skills, and musical skills.

MacLeod and Walter found that the cooperating teachers believed that personal skills, teaching skills, and musical skills are equally important for band, choir and orchestra teaching. These findings are consistent with previous studies. In addition to the importance of personal, teaching, and musical skills, the participants indicated that student teachers need more field experience and internship opportunities, and also need to develop the ability to build positive relationships with students. The participating teachers also mentioned the importance of developing effective rehearsal pacing and error detection skills. Previous studies done by Abrahams (2009) and Conway (2002) also indicated a discrepancy between music education coursework and student teaching (as cited in MacLeod & Walter, 2011). MacLeod and Walter suggested that before music education institutions add extra coursework to address deficiencies in the above-mentioned areas, they should consider addressing the lack of connection between

coursework and student teaching experience that could lead to such deficiencies. In most cases, student teachers are not required to apply the skills and knowledge they gained throughout coursework until they start student teaching, thus leaving a gap between skill acquisition and application. MacLeod and Walter suggest that having students start field experience early in the degree program may bridge the gap between skills acquisition and applying those skills in real-world situations.

Edelman (2016) investigated the perceptions of cooperating mentor teachers about the importance of certain teacher traits as predictors of successful student teaching experience. He employed a simple descriptive as well as comparative descriptive research design in this study. Edelman posed five research questions to help guide his investigations: a) Which traits did cooperating music teachers rate as most important in predicting the success of student teachers? b) What trait categories did cooperating music teachers rate as most important in predicting the success of student teachers? c) Were there differences in the importance ratings of trait categories as a function of teacher's music teaching specialty (band, orchestra, choir, general music), grade level (K-4, 5-8, 9-12), or teaching setting (urban, suburban, rural)? d) Did music teachers interpret the meaning of these traits in the same way?

Edelman adapted the 40-item survey from a previous study done by Teachout (1997) that examined the opinions of pre-service and experienced teachers about the skills and behaviors necessary for successful music teaching. He modified some of the survey items to improve readability and/or match the context of his research criteria. In some cases, Edelman split some statements into two and discarded the ones that lack

clarity. Edelman piloted the adapted and modified survey with five public school directors from different backgrounds who represented specializations in band, orchestra, and choir. Edelman conducted Cronbach's Alpha reliability tests and reported an overall reliability of .91. He also conducted a Cronbach's Alpha on each category of skills and behaviors and reported a reliability coefficient of .82 for the category of personal skills and behaviors, .82 for musical skills and behaviors, and .85 for teaching skills and behaviors.

For the main study, Edelman employed two recruitment methods. First, he employed a snowball sampling method to recruit participants from his immediate circle of colleagues. Second, he contacted the National Association for Music Education (NAfME). NAfME randomly selected 5000 teachers from the membership database and invited them to participate in this study. Of all the participants from both recruiting methods, 620 responded to the survey and 519 met the criteria to be included in the study. The participants represented cooperating teachers who had been teaching for at least 10 years.

Using a 4-point Likert-type scale, the participants rated each of the 40 statements adapted from Teachout (1997) based on what they deemed important traits for a successful student teaching experience. In addition to the 40 items on the survey, the researcher also collected background and demographic information. The survey took approximately 10-15 minutes to complete.

The results of the study indicated that the highest rated student teacher trait was "the student teacher demonstrates appropriate social behaviors with students," and the

lowest rated statement was “the student teacher is a proficient pianist.” Other traits that cooperating teachers rated high were stress management, fostering appropriate student behavior, establishing a positive rapport with others, and enthusiasm.

Another study that investigated the perception of band directors about the skills and characteristics of effective teachers was done by Miksza, Roeder, and Biggs (2010). The purpose of the study was to survey the cooperating mentor teachers’ perceptions regarding certain teacher traits as predictors of successful student teaching experience. Six research questions were generated to guide this investigation:

> (a) What is the relative importance of music, teaching, and/or personal skills or characteristics to effective teaching as perceived by the Colorado band director population? (b) What advice would Colorado band directors give to 1st-year teachers? (c) What are Colorado band directors’ most commonly cited struggles and rewards to music teaching? (d) Will response rate vary as a function of e-survey versus paper survey administration and/or whether respondents received follow-up notification (i.e., post note, no post note)? (e) Will ranking of music, teaching, and/or personal skills and characteristics important to effective teaching vary as a function of e-survey versus paper administration? (f) Will the percentage of respondents completing open-ended items vary as a function of e-survey versus paper survey administration? (Miksza et al., p. 369)

Miksza et al. identified 414 band directors with available mail and email contact information from three sources: district websites, existing universities databases, and the Colorado Bandmaster Association membership database. Miksza et al. then sent out 30-item survey adapted from Teachout (1997). The 30 items included ten each of personal, teaching, and musical skills statements. However, Miksza et al. did not report the reliability of the survey. The band directors ranked the most important statement in each of the three groups, and also ranked the three broad groups of skills (teaching skills, personal characteristics, and musical skills) according to their importance in teaching

music. The survey also included two open-ended questions that elicited struggles and rewards that the band directors encountered in teaching music, and the advice they would give to new school music teacher.

A total of 235 band directors out of 358 responded to the surveys comprising 66%. Miksza et al. calculated means and standard deviation for respondents' ranking of the three groups of skills and behaviors: personal, teaching, and musical skills. In the musical skills category, the band directors ranked maintaining high musical standards the highest, and possession of excellent singing skills the lowest. In the teaching skills category, respondents ranked maintaining classroom management and procedures the highest, and in the personal characteristics, respondents ranked enthusiastic and energetic as the most important personal characteristics. The results also indicated that among the three broad categories, the respondents ranked personal characteristics (M = 1.80) as the most important in successful music teaching, followed by teaching skills (M = 1.86) and musical skills (M = 2.02) respectively. Miksza et al. explained that participants ranked music skills lower in comparison to teaching skills and personal skills, perhaps due to the perception of musical skills as intuitive. The researchers suggested that more attention should be directed at developing and fostering teaching skills and exploring personal skills and characteristics needed for teaching music.

Additionally, the open-ended questions that asked for advice for first-year teachers resulted in 12 coded categories, with perseverance, use of mentors, being organized, and maintaining relationships the most common advice. Miksza et al. also asked the band directors about the struggles and rewards they encountered with their

student teachers. The band directors indicated that motivating students and classroom management were among the frequently reported struggles that band directors encountered, while the frequently reported rewards were student success, instilling love for music, and the opportunity to work with children.

The investigators also asked whether or not a significant difference existed in response rate between the e-survey and the mail survey. Miksza et al. found that e-surveys had higher response rate (M = 36%) than paper surveys (M = 17.5%).

Preservice Teachers', Novice Teachers', and School Students' Perspectives

This section will cover studies that examined the perspectives of preservice, novice, and school students on the skills and behaviors of successful teachers.

One of the studies that discussed the perception of requisite skills and characteristics of music teachers was done by Rohwer and Henry (2004). The purpose of the study was to a) describe the perceptions of college music education faculty regarding the skills and characteristics required for successful teaching, b) describe the perceptions of collegiate music educators regarding the need for assessment of skills and characteristics required for effective teaching, c) provide an overview of the current assessment means of skills and characteristics, and d) compare the perceptions of music educators across teaching areas.

Rohwer and Henry generated 69 Likert-type scale questions for a survey, including 18 questions for musical skills, 27 for teaching skills, and 24 questions for personal skills. They also included 23 open-ended questions in the survey, in addition to the Likert-type questions. Rohwer and Henry utilized a simple random sampling method

to recruit the participants. The researchers also sent out the questionnaire to 1,000 music education professors identified through College Music Society Directory. Four hundred and sixteen participants completed the survey. Additionally, the researchers randomly chose 10 non-respondent participants and contacted them by phone and conducted an interview with the same questions on the survey, and added their responses to the rest of the participants.

Rohwer and Henry calculated the means and standard deviation for each of the three categories (teaching, musical, and personal skills). Rohwer and Henry compared the items within each category using repeated measures ANOVA. The results showed that participants rated teaching skills the highest, followed by personal characteristics and musical skills respectively. Within the category of teaching skills, classroom management was rated highest and questioning skills lowest. In the category of personal skills, the participants rated the ability to motivate the students the highest, while sense of humor was rated the lowest. Also, in the category of musical skills, the participants rated musical expressivity the highest and transposition the lowest.

The researchers found that the most-cited means for assessing skills and characteristics of preservice teachers were a) in-course assessment including testing and peer teaching and other classroom activities, 2) field experience and student teaching, and 3) informal observation. Additionally, when comparing the means for each teaching area on the category of musical skills and behaviors, results showed that choral teachers had the highest means, followed by instrumental and general music teachers.

Napoles and MacLeod (2013) examined the influence of teacher delivery and students' progress on pre-service teachers' perceptions of overall teaching effectiveness. The investigators invited six experienced teachers, two each of brass, voice, and strings, to teach two-minute applied lessons for beginning students. One of the researchers served as a mock student for the short-applied lessons. The lessons were video-recorded.

Napoles and MacLeod asked the teachers who agreed to teach the short applied-lessons to announce two objectives at the beginning of each of their lessons and employ some type of teacher modeling either on their respective instruments or using their voices. The teachers were also asked to provide three specific positive and one negative feedback statement to the students. The two independent variables in this study were teacher delivery and student progress. Four conditions were created: "high teacher delivery and more student progress, high teacher delivery and less student progress, low teacher delivery and more student progress, and low teacher delivery and less student progress" (Napoles & MacLeod, p. 253). The teacher delivery in this study was categorized into high and low intensity according to the teacher's behaviors including eye contact, vocal modulation and volume, facial expression, and energy. Student accomplishment was determined by whether or not the student has achieved the goals set by the teacher.

Five experienced teachers were recruited as independent judges to observe the videotaped two-minute lessons to check the reliability of the tested variables (teachers' delivery and students' accomplishments). These five experienced judges did not receive detailed instructions on how to judge teachers' delivery nor students' progress, similar to

the planned procedure with the undergraduates. Napoles and MacLeod calculated the inter-judge reliability for both teacher delivery and student progress and reported a reliability of 98% for teacher delivery and 79% for student progress.

Napoles and MacLeod recruited 75 music education majors from two state universities located in two different states as primary participants for this study, 26 females and 49 males. The primary participants comprised of choral emphasis (*n = 12)* and instrumental music education majors ($n = 63$). The primary participants ($n = 75$) were asked to view and rate teachers' delivery, students' progress, students' musicianship level, teacher knowledge, and overall teaching effectiveness in 12 two-minute lessons using a 5-point Likert-type scale.

Napoles and MacLeod conducted a multivariate analysis of variance with four conditions, high teacher delivery/ high student progress, low teacher delivery/ low student progress, low teacher delivery/ high student progress, and high teacher delivery/ low student progress in addition to the rating of overall teaching effectiveness. The results of this study showed a significant difference in the responses of the college students between each of the four conditions with moderate positive correlation between the three variables (teacher delivery, student progress, and overall teaching effectiveness). Napoles and MacLeod also found that high teacher delivery/ more student progress rated the highest ($M = 12.74$, $SD = 1.57$), while low teacher delivery/ low student progress were rated lowest ($M = 10.98$, $SD = 2.21$), with high teacher delivery/ low student progress rated second ($M = 11.83$, $SD = 1.70$) and low teacher delivery/ high student progress third ($M = 8.89$, $SD = 2.20$). Napoles and MacLeod also found a

moderate correlation (r = .53) between high teacher delivery and more student progress variables.

Napoles and MacLeod found beginner teachers (primary participants) perceived high teacher delivery as more effective than low teacher delivery regardless of high or low student progress. Napoles and MacLeod also suggested that future research examine and compare the relationship between preservice and experienced teachers' perceptions of student progress, teaching delivery, and overall teaching effectiveness.

Kelly (2008) conducted a descriptive study in which he examined the perceptions of high school band and orchestra students about the skills and behaviors of effective music student teachers. Kelly developed a 34-item survey based on previous studies and piloted the study with 15 participants similar in age and background to the desired participants to make sure that the directions and items could be clearly understood, test how long it would take to complete the survey, and correct misspellings. The15 participants who piloted the survey did not participate in the main study. Kelly did not report the reliability of the survey used in this study.

The researcher administered the survey to 314 high school orchestra and band students in grades 9 to 12 participating in a summer camp. Kelly calculated the mean scores for items 1-34. The results indicated that the skills and behaviors that received the highest mean scores respectively were "Is able to apply knowledge; being competent" (M = 4.959), "Has positive behavior" (M =4.586), "Is respectful of students" (M = 4.563), "Provides clear verbal instruction" (M = 4.538), and "Displays confidence as a teacher" (M = 4.500).

The skills and behaviors that received the lowest mean scores were "Can play the piano" ($M = 2.952$), "Has knowledge of technology" ($M = 3.407$), "Can manage non-instructional duties" ($M = 3.684$), "Is professional" ($M = 3.700$), and "Can model/demonstrate how to play each instrument or sing appropriately" ($M = 3.869$).

Additional statistical tests were carried out to determine whether or not there was a statistically significant difference between students' primary performance area and any teacher skills or behaviors. The results indicated that all participants rated each of the skills and behaviors similarly; however, the first item on the survey, "Deals effectively with student discipline," was significantly different depending on the respondents' year in school F (3, 314) = 2.617, p = .051. Another skill found significantly different depending on the participants' school year was "Able to motivate students" F (3, 314) = 3.050, p = .029. Freshman students rated the item "Deals effectively with students discipline" lower than juniors. The item "Able to motivate students" was rated lowest by seniors, while juniors rated it highest.

Kelly (2008) concluded that effective teaching is frequently influenced by skills and behaviors not directly related to music knowledge or skills. These results are consistent with previous studies (Fox & Beamish, 1989; Kelly, 2000; Madsen & Kaiser, 1999; Teachout, 1997, 2001). Moreover, this study found personal characteristics and instructional behaviors are perceived to be as important as content and musical knowledge.

Hourigan and Scheib (2009) employed a qualitative multiple case study design to examine the needed skills and understanding for a successful student teaching experience

and compared their findings with Perry's Scheme of Intellectual Development. They formulated the following research questions to guide their inquiry: a) What are the reported prerequisite skills, abilities, and/or understandings deemed necessary for a successful student teaching experience? (b) What skills, abilities, and understandings are gained through undergraduate preparation (either through coursework or field experiences)? (c) What early fieldwork experiences are valued by student teachers on the overall preparedness for student teaching? and (d) How are participant understandings and perceptions related to the developmental stages of undergraduates as posited by Perry?

The researchers selected six instrumental music education undergraduates to be included in the study. The participants represented the entire student teaching class of the Spring 2007 semester. The data collection methods included interviews, field observation, and artifacts. Hourigan and Scheib conducted an interview with each of the six participants and discussed topics related to their student teaching. Each interview lasted approximately half an hour and the interviews were transcribed for analysis.

Additionally, during the students' 16 weeks of student teaching, the researchers conducted five observations biweekly with each participant at their teaching sites, totaling 30 observations. Moreover, the researchers also asked each of the participants to keep a weekly open-ended journal entry in which the participants reflected on their student teaching experience.

The collected data were then coded and analyzed for themes using open and closed ended techniques and were categorized in terms of locus and type. Two themes

emerged in the data and were organized around the following two questions: a) what are the skills and understandings, and abilities necessary for student teaching? and b) where can one acquire these skills, understandings, and abilities?

Eleven themes emerged from analyzing the data. Some of the participants expressed that several skills, abilities, and understandings are necessary for successful music teaching including administrative/organizational skills, classroom management skills, interpersonal abilities, work ethic, musicianship skills, content knowledge, pedagogical knowledge, prior experiences and activities, curricular components, and extracurricular experiences.

Some of the participants were surprised at how many administrative tasks need to be performed on a daily basis, while others commented on the classroom management skills required to efficiently and effectively run the ensemble rehearsal. Furthermore, other participants indicated the importance of interpersonal skills to deal with parents, faculty, and students. Several participants commented on the importance of musicianship skills, including conducting and modeling skills. The participants also discussed the importance of content knowledge such as music theory and history. They indicated that content knowledge is as important as musicianship skills for teaching music, in particular stating that the information they acquired through technique courses about the pedagogical knowledge of the various instruments was key to survive in student teaching.

Additionally, one of the participants indicated that persistence and dedication to educate the students were essential for successful student teaching. The participants also listed prior experiences and activities as two crucial sources for developing skills in

music teaching. One of the participants in this study commented on the benefits of developing their individual musicianship through applied lessons and ensemble experience. It is worth noting that the majority of the participants attributed their ability to successfully manage and survive student teaching to instruction received through their method courses and instrument technique courses, while others indicated that they developed these skills through extracurricular experiences such as freelance teaching and teaching private lessons.

Hourigan and Scheib found that the perception of the necessary skills, abilities, and understandings among student teachers was based on their abilities to understand the complexity of the teaching and learning process as highlighted in Perry's Scheme of Intellectual Development. The researchers found each one of the participants in this study represented a stage of Perry's Scheme. Hourigan and Scheib concluded that early field experience provided many learning opportunities and helped develop the necessary skills to survive student teaching.

Lindely (2003) investigated effective choral teacher behaviors that could be used in an assessment instrument. The following research questions guided the study: a) what are important instructional behaviors that secondary public school choral music teachers in the state of Oklahoma believe should be included in a secondary choral music teacher assessment tool?, b) is there a difference of opinion on important instructional behaviors between secondary public school choral music teachers based on years of experience?, c) is there a difference of opinion on important instructional behaviors between teachers in rural and urban school districts?, d) is there a difference of opinion on important

instructional behaviors among secondary public school choral music teachers teaching at the following levels: mid high 9th-10th grades, senior high 11th -12th grades, middle school 6th - 8th grades, junior high 7th – 9th grades?, e) is there a difference of opinion in the important instructional behaviors between secondary public school music teachers from small schools and music teachers from large schools?, f) is there a difference of opinion about important instructional behaviors between secondary public school music teachers of various ages?, and g) is there a difference of opinion in the important instructional behaviors between male and female secondary public school music teachers?

Lindely constructed a list of statements related to teachers' behaviors drawn from Tait's (1992) research on effective music teacher traits, Taeble's (1999) research on improper evaluation criteria, MENC Teacher Evaluation statements, Elliot's (1995) model of the professional music educator, and Tuckman's (1990) work on conducting a meaningful teacher assessment.

Following the construction of the teachers' behaviors list, Lindely consulted a panel of 25 elementary, middle school, and high school choral and general music teachers and asked for suggestions for the main study survey. She then made some adjustments and corrections and presented the survey to a class of graduate students for critique and to determine the face validity of the survey. After all adjustments have been made, Lindely sent out a pilot survey to 100 secondary choral directors, which she randomly selected from the membership of the Kansas Music Educators Association. The researcher reported a response rate of 55% to the pilot study. The researcher used the results from the pilot study to carry out a Cronbach's Alpha reliability test for each item on the

survey. The test showed two weak items: uses music book and uses octavo music. These two items were eliminated from the final version of the survey, which included 35 items. Lindely sent out the survey for the main study to 342 participants and received responses from 180 participants (61% response rate). The researcher used Chi Square statistical test to determine the differences between the groups.

The results of the study showed the following items received the highest participant agreements: 1) models correct musical technique, 2) enthusiasm for subject, 3) uses frequent eye contact, 4) elicits performance, 5) demonstrates concern for the students, 6) stimulates students enthusiasm, 7) personal commitment, 8) demonstrates the ability to stay on task, 9) provides for practice and application, 10) uses facial expression, 11) demonstrates positive feedback, and 12) generates students' interest.

The results also showed the following items received the lowest agreement among the participants: 1) written lesson objectives, 2) performance at adjudicated events as evaluation, 3) performance at community events used as assessment, 4) make objectives known to students, 5) written plan for each class period, 6) uses technology in the classroom, 7) willingness to work on extra-curricular activities, and 8) uses kinesthetic methods. Additionally, the results showed a statistically significant difference in opinions on important instructional behaviors between secondary choral music teachers based on their years of experience. Using Pearson Chi Square, the results of the study showed that there is a statistically significant difference in opinions of important instructional behaviors between secondary choral teachers teaching at the different levels.

Chapter Summary

For the last 30 years, some researchers have been obsessed with understanding how and why teachers behave in certain ways or why those who are deemed successful teachers possess certain traits and skills. Studies investigating the skills and behaviors that teachers perceive as important for music teaching have examined these behaviors and skills from different standpoints. Some studies compared the perception of experienced teachers, mentor teachers, and directors to preservice teachers and novice teachers (Heath-Reynolds, 2014; Moss, 2007; Whitaker, 2011), while others examined the perspectives of only experienced teachers, mentor teachers, or directors regarding teachers' skills, behaviors, and characteristics important for music teaching (Edelman, 2016; MacLeod & Walter, 2011; Miksza, Roeder, & Biggs, 2010). Other studies looked at the necessary teachers' skills, traits, and behaviors from the perspectives of preservice, novice teachers and school students (Hourigan & Scheib 2009; Kelly, 2008; Lindely, 2003; Napoles & MacLeod, 2013; Rohwer & Henry, 2004).

I found four studies that adapted David Teachout's (1997) survey (Edelman 2016; MacLeod & Walter, 2011; Miksza et al., 2010; Moss, 2007). Each of these studies adapted Teachout's (1997) 40-item survey and slightly modified it to suit the context of each study. Although all of aforementioned studies utilized Teachout's 40-item survey, there existed some similarities and differences. Some of these studies employed the same methodology Teachout used to analyze his data, while others used different methods and analysis procedures. In Edelman's study, the participants rated each of the skills and behaviors statements using 4-point Likert-type scale. Edelman then used participants'

ratings to calculate the means and standard deviation for each item and construct a ranked list for each of the skills and behaviors statements. In addition to creating ranked lists in descending order from the highest mean to the lowest mean, Edelman also conducted several inferential statistics such as one-way repeated-measures ANOVA, and mixed effect ANOVA to determine the effect of skills and behaviors designation on the ratings of each group of participants, and to determine whether or not there were statistical differences in ratings based on teachers' specialty area. Moss also asked the participants to rate the importance of each statement of skills and behaviors using 4-point Likert-type scale. She calculated the mean scores for each item of skills and behaviors and constructed ranked lists. Moss utilized Chi-Square test for independence to determine whether or not there were significant differences in perception of where each skills and behaviors statements in each skills and behaviors categories were acquired.

Similar to Moss, Davis (2006) utilized Teachout's survey, asking her participants to rate the importance of each skills and behaviors statement using 4-point Likert-type scale. She calculated the means and standard deviation for each item and constructed ranked lists. Davis utilized a *t*-test for independent samples for each item to determine whether or not there were statistical differences in perception of the two groups of participants on each item. In addition to the *t*-test for independent samples, Davis also conducted a two-way repeated-measures ANOVA to determine whether or not a statistically significant differences existed in perception of the three broad categories of skills and behaviors among the two groups of participants.

To accommodate for the limited variability of raw data as observed in previous

studies, Miksza et al. adapted the ten highest rated skills and behaviors from each of the three broad categories of skills and behaviors from Teachout's study. Instead of asking the participants to rate each item, the researchers asked the participants to rank items from highest to lowest based on their importance in their teaching. Miksza et al. then calculated the means and standard deviation for each item.

MacLeod and Walter asked the participants to rate the importance of each statement using a 7-point Likert-type scale. Utilizing a 5- or 7-point Likert-type scale allowed the participants to have a middle ground instead of forcing them to choose one side of negative or positive rating for each item. The researchers then calculated the overall means for each of the three broad categories for orchestra, choir, and band teachers.

Some of the studies that are based on Teachout's 40-item survey compared the importance ranking of the three broad categories of skills and behaviors (Edelman, 2016; Moss, 2007; MacLeod & Walter, 2011). Some studies found that participants believed personal skills and behaviors are more important than teaching and musical. MacLeod and Walter (2011) found personal, teaching, and musical skills and behaviors have similar means and standard deviations.

The following chapter explains that adaptations I made for this study, which investigated the perspectives of directors, master teachers, and student string teachers involved in String Projects regarding the skills and behaviors important for teaching in the String Project.

Chapter Three

Methodology

The purpose of the study is to investigate the perspectives of String Project directors, master teachers, graduate and undergraduate string teachers regarding the skills and behaviors important for teaching in a String Project.

Research Questions

1. What are the skills and behaviors that String Project directors deem most important for successful String Project teaching?
2. What are the skills and behaviors that String Project master teachers deem most important for successful String Project teaching?
3. What are the skills and behaviors that undergraduate String Project teachers deem most important for successful String Project teaching?
4. What are the skills and behaviors that graduate student String Project teachers deem most important for successful string project teaching?
5. Are there any differences in the three broad categories of skills and behaviors deemed important according to role in the project?
6. Are there any differences between the perspectives of the graduate and undergraduate string teachers regarding the skills and behaviors that they deem necessary according to their semesters of teaching in the String Project?
7. Are there any relationships between music teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors?
8. Are there any differences in perspectives by age, gender, or academic major?

Survey Research

This study utilized a quantitative cross-sectional survey design. In cross-sectional surveys, data are collected at one point in time rather than at multiple times. Cross-sectional surveys are the most popular kind of survey used in educational research (Creswell, 2008). In quantitative research, surveys are used to statistically describe a phenomenon or characteristics of large populations (Miksza & Elpus, 2018). Surveys are usually administered to a sample or, in some cases, the entire population is examined to help researchers develop an understanding of certain characteristics of a population, such as attitudes, opinions, or behaviors. Surveys administered to an entire population are referred to as a census. Survey research involves collecting quantitative data using responses to questions in a written form closed or open-ended questions. Following the data collection process, the researcher determines an appropriate statistical method to describe the results.

Creating a questionnaire or a survey involves planning, constructing questions, quantitative evaluation, and testing the validity of the instrument (Creswell, 2008). Researchers may attempt to develop their own instrument without looking at existing ones that could best suit their needs (Creswell, 2008). Creswell suggested looking at existing instruments before attempting to develop new ones to save time and resources. Additionally, some instruments have been around for a long time and are constantly tested and retested by different researchers for their reliability, which can attest to their credibility (Creswell, 2008). Miksza and Elpus (2018) suggested locating existing research instruments by reviewing published journal articles, dissertations, theses, and

peer-reviewed studies. If usable research instruments cannot be located, existing literature on the topic will provide ideas and issues that could help guide in designing a new instrument. Authors and researchers often report or describe the kind of instrument they utilized in their study and sometimes even provide a few sample items or the entire survey. Another good place to start looking for an existing research instrument is by examining literature reviews, reference lists of educational studies, and *Mental Measurement Yearbooks.* Databases such as ERIC can also be helpful in locating an appropriate research instrument. Researchers usually report the reliability of a new instrument as well as the reliability, context, and analysis methods utilized in previous studies.

For the purpose of this research study, I chose to use a survey created by Teachout (1997) (Appendix A). The purpose of Teachout's study was to compare the opinions of preservice and experienced teachers pertaining to the skills and behaviors important for music teaching. Teachout developed a questionnaire with 40 statements to examine the skills and behaviors important for teaching music. Several researchers (Davis, 2006; Edelman, 2016; MacLeod & Walter, 2011; Miksza et al., 2010; Moss, 2007) adapted Teachout's survey. Teachout developed the statements using three main approaches: (a) "an open-ended questionnaire administered to preservice music teachers from three universities, (b) a thorough search of the related research literature, and (c) a verification of the related literature list by five 'expert' teachers (public school music teachers who have been recognized by peers as being successful and have accumulated at least 10 years of teaching experience)" (p. 45).

Teachout sent the open-ended questionnaires to preservice teachers from three universities. From the preservice teachers' responses, Teachout selected the top 20 ranked items. Teachout also selected another 20 items from expert public school teachers' responses to a list generated from the literature. Teachout then combined the 20 items from preservice teachers and the 20 items from the music experts, making sure not to duplicate any items, to construct his 40-item survey. He then sent out the 40-item survey to 125 preservice teachers and music education faculty who were randomly selected from five universities diverse in location and size, 105 expert public-school teachers from a pool of experienced teachers who served as mentors to preservice teachers from Kent State University, and graduate students with teaching experience. Of the 125 preservice teachers, 98 completed the survey as well as 78 of the 105 experienced teachers. Teachout randomly selected 35 participants from each group who completed the survey to include in his analysis. Teachout calculated the means for each item and created ranking lists for each group to determine which of the 40 items had the highest means in each group. After constructing the ranked list for each group, he placed each item in one of three broad categories: teaching skills and behaviors, personal skills and behaviors, and musical skills and behaviors. Then Teachout conducted a two-way repeated measure ANOVA to compare the mean scores of each of the three broad categories and ranked them for each group.

Reliability and Validity

Whether researchers select an already existing instrument or decide to create their own instrument, they need to test and/or report the reliability of the instrument.

Reliability of measurement means that the scores that an instrument yields are consistent, stable, and replicable. This means that when administering the instrument several times, the scores of each administration should be nearly the same. Also, when an instrument is administered to the same individuals, their responses to related questions must be consistent (Creswell, 2008; Phillips, 2008). Validity of a survey is equally important. It is the extent to which an instrument used in scientific studies is actually measuring what it is intended to measure (Phillips, 2008; Yarbrough, 2008).

Reliability. Phillips (2008) suggested that when reporting the results of any non-experimental quantitative study, the reliability of any measure must be reported, whether it is a test, survey, or author designed non-standardized measure. A reliability coefficient can be calculated using various methods, including split-half reliability, test-retest reliability, parallel forms, KR-20, and coefficient alpha, depending on the measuring tool and the design of the study (Phillips, 2008). The reliability coefficient is represented on a number ranging from 0 to 1.0 depending on the reliability of the scale used, with 0 representing completely inconsistent or unreliable to 1.0 representing complete consistency or very reliable.

Test-retest reliability is a procedure used to examine the degree of stability of the scores of an instrument when administered several times to the same sample group. The scores of an instrument are considered reliable when the instrument is administered to the same individuals two or more times, allowing sufficient time between each administration, and the scores yielded are related at a positive and reasonably high level (Phillips, 2008).

A second procedure that researchers can employ to ensure the reliability of an instrument is known as alternative forms. The alternative forms reliability involves using two versions of the same instrument, administered to the same group, making sure that the results from both versions of the instrument are consistent. The third procedure for testing the reliability of an instrument is a combination of the two previous procedures discussed above. This procedure involves administering two different versions of the same instrument several times to the same individuals, allowing sufficient time between each administration to reduce carry-over effect, and determining the consistency of scores. This reliability testing method serves two purposes: to examine the stability of the scores over time, and the equivalency of the two forms of the same instrument (Creswell, 2008).

Inter-rater reliability is another procedure used when conducting behavioral observation. To ensure the reliability of this kind of instrument, the researcher asks a panel of judges or observers to rate specific behaviors of one or more observed individuals and then compares the scores from all observers to determine whether or not the scores are consistent. Another means to ensuring the reliability of an instrument is to check whether or not the responses to the questions within the instrument are consistent. For example, if an individual answered the first question supporting the theory of greenhouse effect, their responses should be consistent throughout the instrument and not deny the existence of such theory later on the instrument (Phillips, 2008).

Furthermore, Russell (2018) suggested using Cronbach's Alpha, sometimes referred to as reliability coefficient alpha, to calculate internal consistency of a scale or

subscale of an instrument using statistical correlation within the items in an instrument. Russell suggested that, generally, the reliability of items on a survey is acceptable when the reliability coefficient is .70 or higher. I discuss reliability of my study in a later section of this chapter.

Validity. Validity of the instrument deals with whether or not the scores of the participants on the instrument are meaningful and allow the researcher to make sense of the scores and draw accurate conclusions. The results of any given study can be considered invalid if the study was poorly designed, the questions on the measuring instrument are unclear or misunderstood by the participants, or when participants experience fatigue and stress during the administration of the instrument. Other factors that could adversely affect the validity of a measuring instrument are the inability to make useful predictions from the scores of an instrument and using poorly designed questions or measures of variables (Creswell, 2008).

To ensure the validity of a measuring instrument, researchers test the content validity, criterion-related validity, construct validity, or a combination of these procedures. Content validity deals with how well the questions of an instrument are constructed and whether the questions represent all the possible questions that a researcher can ask about the content or a skill. To ensure the content of an instrument is valid, researchers examine the plan and procedures used in constructing the instrument, the objectives of the instrument, the content areas, and the difficulty of the questions.

This can be achieved by consulting a panel of experts who review the instrument and provide feedback to adjust the content or the questions of the instrument to better suit

the research criteria. It is worth noting that consulting a panel of experts is useful when the possible of questions are known and easily recognizable. It is less useful when the researcher is, for example, assessing personality, IQ, or aptitude scores because the universe of questions are less certain (Phillips, 2008).

Another way to ensure the validity of a measuring instrument is by examining criterion-related validity. Criterion-related validity deals with whether or not the scores of an instrument are useful in predicting the desired outcome. This can be achieved by testing predictive and concurrent validity. In predictive validity, the researcher utilizes the scores of a test to predict certain outcomes. This test is conducted before gathering the criterion information. Concurrent validity gathers both test and criterion measures simultaneously. This test is carried out when a researcher is interested in assessing current information including skills, knowledge, interests, or personal characteristics (Creswell, 2008).

The third method to ensuring the validity of a measuring instrument is called construct validity. This can be achieved by ensuring the scores from an instrument are meaningful, useful, and have a purpose and help the researcher develop a better understanding about a sample of a population (Creswell, 2008). A researcher can ensure construct validity through statistically assessing whether the scores of items on the survey are related to what he or she is trying to measure. For example, if the researcher is interested in measuring the level of anxiety in students while taking an exam and the researcher decided to create a self-report survey to assess the anxiety level of students while taking an exam, the researcher can ensure the construct validity by carrying out

statistical tests to ensure that each item on the survey is related to and can help in assessing the level of students' anxiety while taking an exam. Another procedure that researchers can do to ensure construct validity is through testing whether or not the collected data supports the proposed theory (e.g., student anxiety increase when taking an exam) (Phillips, 2008).

Validity and Reliability in Teachout (1997)

Teachout (1997) formulated his 40-item survey by administering an open-ended questionnaire to preservice teachers asking them to list the skills and behaviors they deem necessary for music teaching, conducting a thorough review of the literature, and verifying those skills and behaviors identified in the literature with expert public-school teachers. Teachout created the 40-item list by choosing the 20 items most frequently mentioned from the preservice questionnaire and the top 20 items most frequently mentioned by the expert public-school teachers, and combined the two lists, making sure not to duplicate items from the preservice top 20 list and the top 20 item list from the public-school expert teachers. He then employed three subscales or categories to label each skill and behavior type. Teachout combined all the skills and behaviors that he believed were related to teacher's personality under "personal skills and behaviors," all the skills and behaviors statements related to teaching under "teaching skills and behaviors," and all the skills and behaviors related to musical skills and behaviors under "musical skills and behaviors" category. However, some existing studies based on Teachout's 40-item survey used different designations for some of Teachout's original

statements. He did not mention testing his survey to ensure the reliability and validity of the instrument.

Reliability and Validity in Studies that Adapted Teachout's Survey

Edelman (2016) adapted the 40-item survey from Teachout's (1997) study. He modified some of statements on Teachout's survey and eliminated others. After he made the changes, he tested the face validity of his adapted survey. He used a panel of three judges and asked them to designate each of the statements to one of three broad categories; personal, teaching, and musical traits. The results showed that the judges disagreed on 13 items. The panel of judges then discussed the 13 items of disagreement and consequently agreed on all 40 items. Edelman then compared his modified adapted survey with Teachout's original survey and found that five items on the modified survey were categorized differently than Teachout's original study.

This suggests that different music education experts and preservice teachers may have different interpretations for the categories of personal, teaching, and musical skills and behaviors. In the current study, I asked 8 music education experts to assign each of the 40 statements to one of the three broad categories of skills and behaviors and found that the experts did not fully agreed on the designation of 30 out of the 40 statements (see Appendices B and L). I did not further investigate the designation differences between Teachout and the current study because most of the studies that are based on Teachout's survey modified some of the statements either to improve readability or to make the statement suitable for their research criterion. These modifications ranged from changing

a few words but retaining the meaning of the statement, to making changes that would change the meaning of the entire statement.

Edelman also conducted a Cronbach's Alpha reliability test and reported an overall reliability coefficient of ($\alpha = .91$). MacLeod and Walter (2011), Moss (2007), Miksza et al. (2010) did not report anything related to the validity or reliability of their instruments. Phillips (2008) suggested that one of the criteria for choosing an existing survey is to check whether or not the survey is widely used. This will give some indication that the questions on the instrument provide reliable and consistent results. For this reason, I selected Teachout's survey for the present study.

Reliability and Validity in the Current Study

The survey for the current study is based on 40 statements adapted from Teachout's (1997) study that examined pre-service and experienced music teachers' opinions of the skills and behaviors important for successful music teaching. For the purpose of the current study, I have modified some of these statements to be more suitable for String Project directors, master teachers, and graduate and undergraduate string teachers. I created a list of all the statements and modifications to help me keep track of the changes made and the reason why some slight modification was necessary (Appendix A).

After constructing the survey, I sent the survey to several music education faculty members and doctoral students to review the content of the survey, to rectify any issues related to the presentation of the questions and to check for grammatical errors. One of the issues that arose was that, when modifying the survey from Teachout's original

statements, sometimes the statements did not grammatically match the heading sentence I created for my survey. I edited some of the wording of the statements to match the grammatical content of the heading sentence.

Additionally, some of the skills and behaviors included in Teachout's original study were not directly related to teaching strings or caused confusion for the people who pre-tested the survey. For example, one of the statements reads as follows: "Possess excellent singing skills." While some string teachers do incorporate singing in their teaching, many may consider "excellent" singing skills unnecessary and therefore may rank this statement low, which will affect the content validity of the survey. I revised this item to state "incorporates singing while teaching." Additionally, Teachout's original survey included statements that are more suitable for group instruction settings than private lessons. For example, item 9, "maintain effective rehearsal pace" may be confusing to String Project teachers who only teach private lessons; I changed it to "maintain an effective pace." This way both private and group instruction teachers were able to respond to this item more precisely.

I made other changes to Teachout's 40 statements because some of the faculty and graduate students who pre-tested the survey reported some statements were not very clear in meaning. For example, one comment I received about the clarity of the statements was related to statement 12, "Move toward and among the group." Some of the survey reviewers reported not really understanding the meaning, so I changed the statement to "Uses physical space appropriately," which also made this statement suitable for private teachers.

Other changes related to Teachout's survey included eliminating the excessive use of the word "excellent." Excellent is a relative term and, in some cases, the pre-testers reported difficulties understanding the meanings of some of the items that contained the word "excellent." For example, I changed Teachout's item 20, which reads "possess excellent ear-training skills," to "possess aural skills," and changed item 24, "have excellent speaking skills (diction, tonal inflection, vocabulary)," to "give clear instruction." While musicians in general need to possess reasonable aural skills to allow them to asses various aspects of music performance and error detection, using a strong adjective like "excellent" may adversely affect the responses of the participants.

Furthermore, other items on the original list contained more than one skill, behavior, or characteristic and therefore were confusing or could have several interpretations. For example, Teachout's item 31 reads, "possess excellent sight-reading (sight-singing) skills." To many music educators and musicians, sight-reading and sight singing are completely different things and leaving the statement in its original form may create confusion; therefore, I changed the statement to "possess excellent sight-reading skills." Additionally, sight singing is not usually used in string teaching; however, string teachers may incorporate humming or singing specific passages to assess their students' understanding of the passage rhythmically or melodically.

For the current study, after administering the survey, I performed several separate Cronbach's alpha reliability analyses to determine the internal consistency of the three subscales of skills and behaviors, namely teaching skills and behaviors ($\alpha = .864$), personal skills and behaviors ($\alpha = .889$), and musical skills and behaviors ($\alpha = .784$). All

three subscales of the three broad categories of skills and behaviors show moderate to strong reliability.

In addition to the subscale reliability analyses, I also conducted an overall Cronbach's Alpha reliability analysis on all 40 items of the survey to determine the overall internal consistency of the survey items. The results of the Cronbach's Alpha reliability coefficient indicate that the 40 items are highly consistent ($\alpha = .939$). This may be indicative that all 40 items on the survey have a mutual relationship or connection. This will be further investigated in chapter four and five of this study.

Structure of the Electronic Survey Instrument

I designed the electronic survey to include four sections (see Appendix C). The first section collected background information such as age, gender, number of years of experience teaching at a String Project, and participant's role (Project director, master teacher, undergraduate, or graduate student teacher). In addition to this information, I also asked the participants to indicate any other music teaching experiences they have outside of the String Project, such as school teaching or private lessons. As I examined each String Project website, I noticed that some prospective participants serve multiple roles. The second section, therefore, included questions 5 and 6 to allow participants to indicate if they were serving or have served in multiple roles. Question 5 asked the participants about their current role or roles they were serving at the String Project, while question 6 asked if they served other roles in the String Project in the past.

The third section of the survey assessed the skills and instructional behaviors that the participants deemed important for teaching strings in a String Project. This section

contained the 40 modified items adapted from Teachout's 1997 study. I designed this section so that participants could not move to the next section without responding to each of the 40 items to ensure that each response is usable in the analysis.

The fourth and last section was left optional for those who wish to be interviewed. If they wanted to talk with me about their experiences teaching in a String Project, they could provide their contact information. However, due to time restrictions, I did not conduct any interviews.

Participants

While it is a common practice to use the terms "subjects" and "sample" in statistical studies, the APA 6th edition suggests using the term "participants" when describing human subjects. The term "subject" implies that the recruited participants are acted on instead of being the actors (APA, 2009). Therefore, for the purpose of this study, all individuals who consented to take part in this study are referred to as participants or respondents.

The participants for this study were string teachers and directors involved in String Projects across the United States. According to the National String Project Consortium website, there are 40 String Project sites across the United States. Using data from the National String Project Consortium website, I identified potential participants for this study by creating a database that contained all String Projects in the United States (Appendix D). I then navigated to each String Project website and collected other information such as location, year of establishment, name of directors and master teachers and their contact information.

I started the participant identification process in April 2018 by contacting the String Projects directors and master teachers involved in the 40 universities that host String Projects. I sent a cover letter explaining the objectives, the data gathering method, and duration of data collection (Appendix E). The cover letter included a recruitment letter. The cover letter asked String Project directors whether or not they were willing to take part in this study and asked them to forward the participant recruitment letter (Appendix F), which included a link to the electronic survey, to their master teachers, and graduate and undergraduate string teachers who were teaching private lessons and group instruction. Only those who were 18 or over and could speak fluent English participated in this study. I also sent three follow-up emails to String Projects that did not respond to the invitation email.

The survey yielded 75 responses from 20 String Project sites (see chapter 4 for details). The participants for this study consisted of four groups: String Project directors (n = 16), master teachers (n = 7), graduate string teachers (n = 6), and undergraduate string teachers (n = 46). Graduate and undergraduate string instructors taught either private lessons or class or both. These string teachers varied in experience from one semester to four or more years of music teaching. In some cases, string teachers who started teaching at the String Project during their undergraduate years may have also continued teaching in the program as graduate students. Likewise, some graduate students who taught during their graduate program may also have more than four years of music-teaching experience at the String Project. For example, if they started teaching at the String Project during their studies for their master's degree and then decided to

continue their education as a doctoral student, they continued their teaching for the String Project. Data from the survey also showed that some participants serve multiple roles for a String Project. For example, some master teachers also serve as directors of the program. The diversity of music teaching experiences represented in the four groups of participants provides valuable information about how teachers with different music-teaching experiences perceive the 40 statements pertaining to the skills and behaviors deemed important for teaching strings. Additionally, identifying String Project directors, master teachers, and those who serve as both directors and master teachers provides rich and more detailed information about the nature of these programs.

Interviews

The last section of the survey collected contact information of those who volunteered their contact information and invited them to participate in one follow-up interview lasting up to 45 minutes. The interviews could have helped develop a better understanding of the quantitative data gathered through the survey. My intention was to purposefully select up to eight participants who completed the survey based on their responses to the items on the survey, their music-teaching experience within String Project and outside of String Project, their age, and the role(s) they served at the String Project. I used the quantitative data from the survey to generate questions for a semi-structured interview protocol (Appendix G, sample interview questions). However, this part of the study was eliminated due to time restraints.

Data Collection

Data collection started in the spring of 2018. After obtaining approval from the music education faculty at Arizona State University and permission for the IRB office to conduct the study (see Appendix H), I contacted all 40 String Projects listed on the National String Project Consortium website in April 2018. The data collection process lasted five weeks, during which I sent out one reminder email every week until the end of the data collection process. Following data collection, I prepared the raw data to be imported into the SPSS statistics program. Participants from 19 String Project sites (approx. 50%) responded to the cover email and agreed to forward a cover letter that included a link to the electronic survey to their string teachers. Only one String Project director responded to the cover email stating that he could not forward the survey to their string project teachers because they have already completed another survey earlier. The survey resulted in 75 responses from 20 String Project sites across the United States. It was difficult to calculate response rate because I did not know how many directors and teachers received the survey.

Preparing the Raw Data

One of the issues that I ran into when preparing the raw data was with question number 2 on the electronic survey. I created an open-ended question to record the name of the String Project that the participant was involved in. This resulted in different names for the same String Project, as some participants used abbreviations while others spelled out the full name of the institution that hosts the String Project. To avoid redundancy, I manually unified the names of the schools that host String Projects, verified that all

questions on the survey were answered and there were no missing cells for each participant. I then imported the raw data into the SPSS statistics computer software to be analyzed.

Analysis

This section discusses procedures that similar studies to the current one utilized to process and analyze their data, in addition to providing a brief explanation of the statistical procedures I used to analyze my data. All previous studies discussed in this section calculated mean scores for each item and generated lists that ranked those means to determine the importance of each item. Some researchers utilized statistical procedures such as ANOVA to determine whether or not there existed statistically significant differences between the three broad variables of personal, teaching, and musical skills and behaviors.

Analysis Procedures for Studies Adapting Teachout's 40 items

Teachout (1997) and other researchers adapting his survey used two methods to analyze the raw scores. To determine the ranking order of each item on the survey, Teachout calculated the mean scores for each item for both expert and preservice teachers and generated a ranking list of the 40 items for each of the two groups of participants; expert music teachers and preservice teachers. He then placed each item into one of three broad categories of skills and behaviors: teaching skills and behaviors, personal skills and behaviors, and musical skills and behaviors. Following the designation of each item on the survey, he conducted a two-way repeated measures ANOVA with the independent variables of teaching experience containing two levels (expert and preservice teachers),

and the independent variable of skills and behaviors with three categories (teaching skills and behaviors, personal skills and behaviors, and musical skills and behaviors) as repeated measures to test differences between group means.

Similarly, to determine the traits (skills and behaviors) cooperating teachers rated as most important in predicting the success of student teaching experience, Edelman (2016) created a ranking table with all 40 items adapted from Teachout's study. Additionally, he used a one-way repeated measure ANOVA to determine which of the three broad categories of traits the cooperating teachers rated most important in predicting the success of student teaching experience. When the one-way repeated measure ANOVA showed a significant difference between the three categories of traits, Edelman conducted additional three paired sample *t* tests as a post hoc multiple comparison procedure to determine which of the three traits categories were significant. To account for type I error, Edelman set the alpha level for each of the three paired *t* tests at $p = .017$. Edelman did not provide details about how he set the alpha level.

Moss (2007) also calculated the mean scores for each of the 40 items and generated a ranking list for each participants group, to determine which of the 40 statements ranked most important for instrumental music teaching among experienced and novice teachers. Moss did not conduct additional statistical procedures to determine which of the three categories of skills and behaviors highlighted in Teachout's study were deemed important by the two groups of participants. MacLeod and Walter (2011) calculated the overall mean scores for personal, teaching, and musical skills and behaviors. In addition to the overall means for personal teaching and musical skills and

behaviors, MacLeod and Walter also calculated the means for orchestra, band, and choir for all three broad categories of skills and behaviors. Kelly (2008) also examined high school students' perceptions of effective music student teacher traits and found similar results as Edelman (2016), Moss (2007), and Teachout (1997) although Kelly did not place his 34 items into three broad categories of personal, teaching, and musical skills and behaviors.

ANOVA and MANOVA

Repeated-measures ANOVA is usually used when a researcher is interested in determining whether or not there are mean differences between dependent samples over time. In other words, repeated-measures ANOVAs is used to test the impact of the independent variable on a single dependent variable after different treatment or under different conditions. Additionally, repeated-measures ANOVA incorporates the correlation between the repeated measures, therefore, violates the assumption of independence of the observations in the standard ANOVA procedure (Russell, 2018). With both ANOVA and MANOVA, the sample is measured several times on different occasions, however, in multivariate analysis of variance (MANOVA), each dependent variable represents different measurement or characteristics. MANOVA is used when the researcher is interested in comparing two or more groups on multiple dependent variables. Therefore, the most appropriate inferential statistic for the current study is multivariate analysis of variance (MANOVA).

Analysis Procedures for the current study

For the current study, I chose to calculate the means scores for each of the 40 statements pertaining to the skills and behaviors important for teaching strings at the String Project, in addition to conducting several other statistical procedures to determine whether or not there were significant differences in perspective between the four groups of participants. I also examined the statistical relationships between the participants' teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors. I constructed a table containing all research questions, null hypotheses for each question (when applicable), and the statistical procedure to answer each research question (see Table 1).

Table 1

Research Questions, Null Hypotheses, and Corresponding Measurement Instrument

Research Question	Null Hypothesis	Question on Instrument	Statistical
Q1. What are the skills and behaviors that String Project directors and master teachers deem most important for successful String Project teaching?	There is no null hypothesis. (Descriptive statistics)	Section 4 of the instrument. Q1–Q40	Descriptive Statistics
Q2. What are the skills and behaviors that String Project master teachers deem most important for successful String Project teaching?	There is no null hypothesis. (Descriptive statistics)	Section 4 of the instrument. Q1–Q40	Descriptive Statistics
Q3. What are the skills and behaviors that undergraduate String Project teachers deem important for successful String Project teaching?	There is no null hypothesis. (Descriptive statistics)	Section 4 of the instrument. Q1–Q40	Descriptive Statistics
Q4. What are the most important skills and behaviors that graduate student String Project teachers deem necessary for successful String Project teaching?	There is no null hypothesis. (Descriptive statistics)	Section 4 of the instrument. Q1–Q40	Descriptive Statistics

Research Question	Null Hypothesis	Question on Instrument	Statistical
Q5. Are there any differences in the three categories of skills and behaviors deemed important according to role in the project?	There are no statistical differences in perception of important skills and behaviors between the roles.	Section 2 of the instrument. Q4 and section 4. Q1–Q40.	(One-way MANOVA with the means of teaching, personal, and musical skills as dependent variables and the roles as a predictor variable.
Q6. Are there any differences between the perspectives of the graduate and undergraduate string teachers regarding the three broad categories of skills and behaviors that they deem necessary according to their semesters of teaching in the String Project?	There are no statistically significant differences between the perspectives of student teachers regarding the skills and behaviors according to their semesters of teaching in the String Project.	Section 2 of the instrument: Q9 and section 4: Q1–Q40.	One-way MANOVA with teaching experience inside the String Project as the IV and the means of personal, teaching, and musical skills and behaviors as dependent variables

Research Question	Null Hypothesis	Question on Instrument	Statistical
Q7. Are there any relationships between music teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors?	There are no statistical differences between those who have additional music teaching experiences outside of the String Project and those who do not.	Section 2: Q1 and section 3 of the instrument Q1.	Pearson Correlation examining the relationship between teaching experience outside of the String Project, mean scores for personal, teaching, and musical skills and behaviors.
Q8. Are there any differences in perspectives by age, gender, or academic major?	There are no significant differences in perspectives by age, gender, or academic major.	Section 2 (Demographics)	Factorial ANOVA with IVs age, gender, and academic majors as predictor variables.

Descriptive Statistics

Descriptive statistics are be used to report certain characteristics of a sample that the researcher is interested in exploring and reporting in a numerical format. Another reason for using descriptive statistics is to help the reader make sense of the raw data (Russell, 2018).

For the current study, descriptive statistics were used to provide an overview of the participants' role at the String Project, age, years of music teaching experience within the String Project, years of teaching experience outside of the String Project, whether or not the participants serve or have served multiple roles at the String Project, location of the String Project, and number of participants from each String Project. In addition to the general descriptive statistics, I also utilized descriptive statistics to determine the rank order of the 40 statements in the survey for each of the participants groups: directors, master teachers, graduate string teachers, and undergraduate string teachers. Furthermore, I utilized descriptive statistics to determine the rank order for each category of skills and behaviors. I generated four tables, each table contains the ranking of one category of skills and behaviors. The results are presented in Chapter 4.

Question 1 asks: What are the skills and behaviors among the 40 skills and behaviors on the survey that String Project directors deem most important for successful String Project teaching? To answer this question, I used responses from the participants in the directors' group to create a ranking list (see Table 8).

Questions 2 asks: What are the skills and behaviors among the 40 skills and behaviors on the survey that String Project master teachers deem most important for

successful String Project teaching? To answer this question, I created a ranking list of all 40 items using participant responses from the master teachers' group (see Table 9).

Question 3 asks: What are the skills and behaviors among the 40 skills and behaviors on the survey that String Project that undergraduate string teachers deem most important for successful String Project teaching? To answer this question, I created a ranking list utilizing the responses of the undergraduate string teachers to calculate the mean scores for each of the 40 statements (see Table 10).

Question 4 asks: What are the skills and behaviors among the four skills and behaviors on the survey that String Project that graduate string teachers deem most important for successful String Project teaching? To answer this question, I calculated the mean scores for each of the 40 items on survey. I then constructed a ranking list using the mean scores for the graduate string teachers (see Table 11).

Inferential Statistical Procedures

Prior to conducting any inferential statistical procedures, I examined the assumptions that were needed to conduct a MANOVA. I used QQ plots for personal, teaching, and musical skills and behaviors to verify normally distributed data in all three categories (See Appendices I, J, K). I also, tested the assumption of equality using Box's M test of equality of covariances matrices. Box's M showed significant differences between the matrices of the covariance (Box's M value = 1.89, $p = .015$) based on alpha level of $p = .05$. However, Huberty and Petoskey (2000) indicated that both the Bartllet and Box's M tests are extremely powerful tests and they recommended proceeding with the MANOVA if the p value of the F test for Box's M is higher than .005.

After making sure all of the assumptions for conducting MANOVA had been met, I then calculated the mean and standard deviation for each item for all four participant groups. I then used these means to calculate the overall means for each of the three broad categories of teaching skills and behaviors, personal skills and behaviors, and musical skills and behaviors for each participant group using the SPSS computer software. To determine whether or not there were statistical differences in perspectives between the four groups of participants regarding the skills and behaviors important for teaching strings, I conducted several one-way Multivariate Analyses of Variance (MANOVA) with the role at the String Project as the independent variable, and the three broad categories of skills and behaviors as dependent variables.

Question 5 asks: Are there any differences in the three categories of skills and behaviors deemed important according to role in the project? To answer this question, I calculated the mean scores for each of the three broad categories of skills and behaviors. I then conducted a one-way MANOVA using the participant groups with four levels and the mean scores of the three broad categories. The results are presented in Chapter 4, Table 13.

Question 6 asks: Are there any differences between the perspectives of the graduate and undergraduate string teachers regarding the three broad categories of skills and behaviors that they deem necessary according to their semesters of teaching in the String Project? To answer this research question, I used the participants' teaching experience within String Project as the independent variable and the mean scores of the three broad categories of skills and behaviors as dependent variables to conduct a one-way MANOVA. The results are presented in Table 13.

Question 7 asks: Are there any relationships between music teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors? To answer this question, I constructed a Pearson Product-Moment Correlation matrix using participants' teaching experience outside of the String Project and the three broad categories to determine whether or not there exist any significant relationships between participants' music teaching experience outside of the String Project and their rankings of the three broad categories of teaching, personal, musical skills and behaviors. The results of the Pearson Correlation matrix are presented in Table 14.

Question 8 asks: Are there any differences in perspectives by age, gender, or academic major? My intention was to compare age, gender, and academic major using factorial ANOVA to determine whether or not there were interactions between the three variables. However, due to the small cell size of some participant groups, it is difficult to detect statistical significance, given the cell size needed to test each of three variables. I considered non-parametric statistical test such Kruskill Wallis; however, to do this, the data would need to be reduced to fewer levels, which would not yield meaningful results.

Additional Analysis

To further investigate how each group of participants ranked each category of the skills and behaviors, I reconstructed the ranking lists based on the three broad categories of skills and behaviors, which resulted in different ranking orders for each group of skills and behaviors for each group. Each list encompasses the rankings of all skills and behaviors designated as one of the three categories. The results are presented in Table 15 in Chapter 4.

Chapter Four

Results

The purpose of this study was to investigate the perspectives of String Project directors, master teachers, and string instructors pertaining to the skills and behaviors that they deem important for successful string teaching.

I generated the following research questions to guide my inquiry:

1. What are the skills and behaviors that String Project directors deem most important for successful string project teaching?
2. What are the skills and behaviors that String Project master teachers deem most important for successful String Project teaching?
3. What are the skills and behaviors that undergraduate String Project teachers deem most important for successful String Project teaching?
4. What are the skills and behaviors that graduate student String Project teachers deem most important for successful String Project teaching?
5. Are there any differences in the three categories of skills and behaviors deemed important according to role in the Project?
6. Are there any differences between the perspectives of the graduate and undergraduate string teachers regarding the skills and behaviors that they deem necessary according to their semesters of teaching in the String Project?
7. Are there any relationships between music teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors?
8. Are there any differences in perspectives by age, gender, or academic major?

In this chapter, I present the results of the analysis of the data collected using the 40-item survey (Appendix C). The 40 items on the survey were adapted from Teachout (1997) and modified to match the context of the current study. In addition to the 40 items included in the survey, I also collected demographic information: age, gender, location, role at the String Project, years of music-teaching experience within the String Project, participants' academic level, participants' academic degree, and years of music-teaching experience outside of the String Project. At the end of the survey, I included an optional section for those who were interested to be interviewed for a planned qualitative part of this study; however, I did not complete the qualitative portion due to time restrictions. This section collected names and contact information of the participants who agreed to be interviewed. Therefore, not all survey responses were anonymous because in Section 3 some respondents volunteered their contact information. Thirty-nine participants expressed interest in being interviewed. I sent out the 40-item survey to 40 String Projects across the United States and received 75 responses, representing 20 different String Projects. However, I was unable to calculate the response rate because I did not get responses from all String Project directors in the United States and therefore, the total number of potential respondents was unknown.

Following the data collection, I conducted a descriptive analysis to answer research questions 1–4. To answer questions 5–7, I also conducted a one-way MANOVA with the three broad categories of teaching, personal, and musical skills and behaviors as the dependent variables and the current role at the String Project as a predictor.

Some participants served multiple roles in the String Project, so I designed the first section of the survey to allow the respondents to specify what role they served

during the data collection phase of this study, as well as previous roles they served in the String Project. I also asked the participants to indicate whether or not they have served more than one role during their involvement in the String Project.

Preparing Raw Data for Analysis

I ran into a few minor problems when preparing the raw data before importing into SPSS to be analyzed. I made every effort to ensure that the participants responded to each question on the survey; however, a few participants did not include the name of their university String Project. Fortunately, I was able to track these participants to their String Project by using information such as the state (location) or their volunteered contact information in section 3 of the survey.

Another problem I encountered when preparing the raw data to be analyzed was discrepancies in the names of the schools that host the String Projects. To avoid creating a tedious list of all the universities that house String Projects, I formatted an open-ended question to ask, "What String Project are you involved in?" Participants responded by writing a short answer. This resulted in having different names for some university String Projects, as some participants used abbreviations, while other participants spelled the name of the school, followed by S.P. denoting String Project. To avoid redundancy when importing the data into SPSS, I manually unified the names using appropriate abbreviations.

Descriptive Statistics

I used SPSS computer software to calculate descriptive statistics to answer questions 1–4. The descriptive statistics showed that participants represented 19 institutions from 15 different states (N = 75), with the majority of the participants coming from Arizona State University (n = 18), followed by University of Texas San Antonio (n = 8). Table 1 and Figure 1 show all participating String Projects, and the number, and percentage of participants from each String Project site. Among the 75 responses were 16 String Project directors, 7 master teachers, 6 graduate string teachers, and 46 undergraduate string teachers. The descriptive statistics also show females comprising 66.7% (n = 50) of the total sample and males representing 32% (n = 24), with one participant in the other category, representing 1.3%. The majority of the participants were in the age range of 18–22 (n = 45). Participants' age data is presented in Table 2.

Table 2

University String Project

	Frequency	Percent	Cumulative Percent
Arizona State University	18	24.0	24.0
Baylor University	3	4.0	28.0
Ithaca College	2	2.7	30.7
McNeese State University	1	1.3	32.0
Northern Kentucky University	2	2.7	34.7
Pacific University	5	6.7	41.3
Temple University	2	2.7	44.0
Tennessee Tech University	4	5.3	49.3
Texas Tech University	6	8.0	57.3
The University of Texas-San Antonio	8	10.7	68.0
University of Georgia	1	1.3	69.3
University of Nebraska Kearney	2	2.7	72.0
University of North Texas	5	6.7	78.7
University of Northern Colorado	2	2.7	81.3
University of Redlands	5	6.7	88.0
University of South Carolina	5	6.7	94.7
University of Texas Austin	1	1.3	96.0
University of Wyoming	2	2.7	98.7
Virginia Tech	1	1.3	100.0
Total	75	100.0	

Figure 1

Participating String Project and percentage of the total sample size

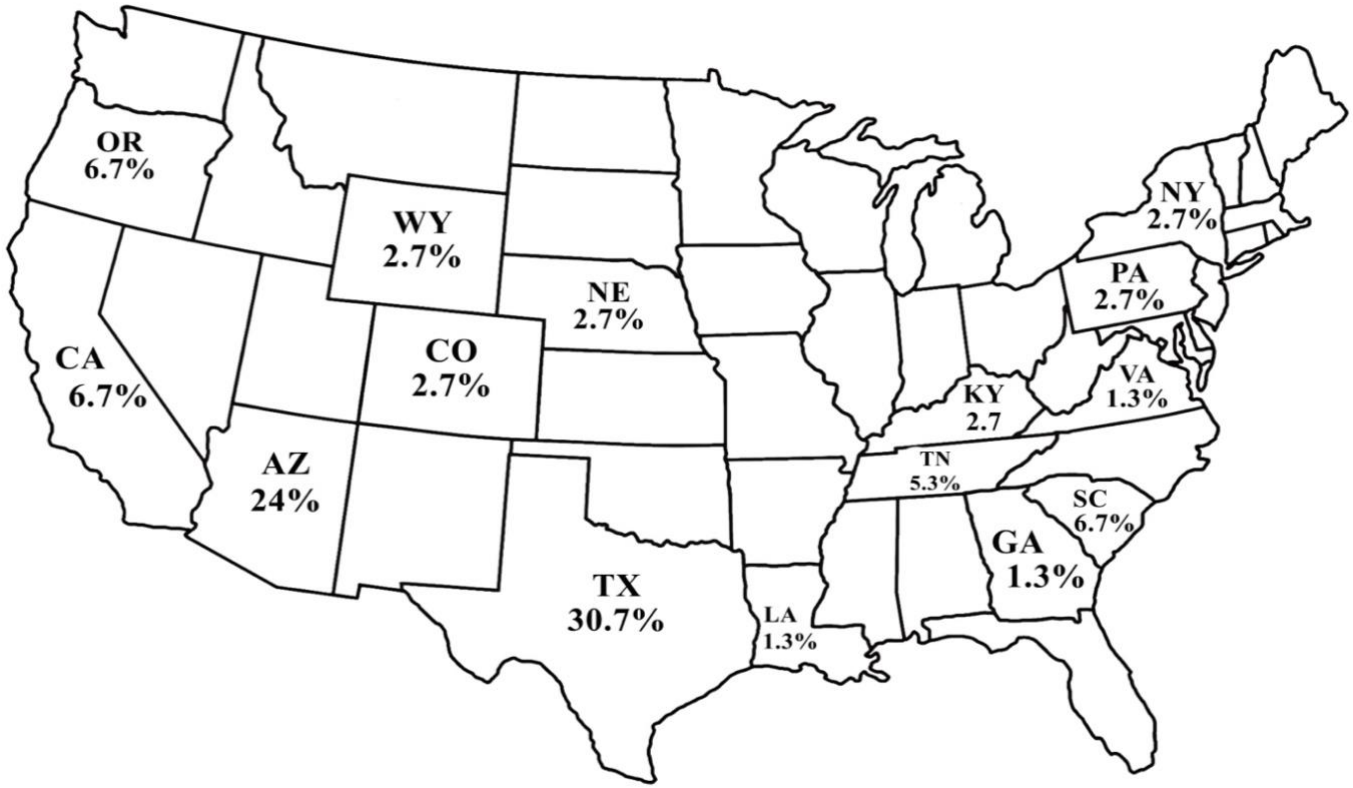

Table 3

Frequency and percentage of participants' age range

How old are you?			
Age	Frequency	Percent	Cumulative Percent
18–22	45	60.0	60.0
23–27	6	8.0	68.0
28–32	2	2.7	70.7
33–37	4	5.3	76.0
38–42	1	1.3	77.3
43–47	1	1.3	78.7
48–52	3	4.0	82.7
53–57	2	2.7	85.3
58–62	4	5.3	90.7
63–67	6	8.0	98.7
68–72	1	1.3	100.0
Total	75	100.0	

Question 7 asked about the participants' undergraduate degree, whether in-progress or already earned. I included four statements for the participants to choose their major from: 1) music education, 2) music performance, 3) other music majors, 4) other majors. The results show 53.3% (n = 40) hold or are enrolled in an undergraduate degree in music education, while 25.3% (n =19) indicated that they currently hold or are working

on an undergraduate degree in music performance. Additionally, other undergraduate music majors comprise 8% (n = 6) of the total participants. Only 13% (n = 10) of the participants hold or are working on undergraduate degrees outside of the field of music. It is worth noting that 65 of the 75 participants were majoring in music. Data are presented in Table 3.

Table 4

Participants' undergraduate degrees, frequency, and percentage

My undergraduate degree is or was	Frequency	Percent	Cumulative Percent
Music Education major	40	53.3	53.3
Music Performance major	19	25.3	78.7
Other major	10	13.3	92.0
Other music major	6	8.0	100.0
Total	75	100.0	

Question 8 collected the participants' graduate-degree participation. The participants were instructed to indicate their graduate degree(s) earned or still in-progress. I included five statements for the participants to choose from; 1) music education, 2) music performance, 3) other music majors, 4) other majors, and 5) do not have graduate degree, or I am an undergraduate student. Approximately 68% (n = 51) of the participants indicated they were not enrolled in or did not have a graduate degree, while those who have completed or still are working on a graduate degree in music education and music performance comprised 12% each. Results for question 8 are presented in Table 4.

Table 5

My graduate degree is or was

	Frequency	Percent	Valid Percent	Cumulative Percent
Do not have a graduate degree (or I am undergraduate student)	51	68	68	68.0
Music Education major	12	16.0	16.0	84.0
Music Performance major	12	16.0	16.0	100.0
Total	75	100.0	100.0	

In the demographic section of the 40-item survey, I included two questions to determine all participants' current and past role(s) at the String Project. Question 5 on the survey asks, "My current primary role at the String Project is". Participants chose one of four statements: director (n = 16), master teacher (n = 7), graduate string teachers (n = 6), or undergraduate string teachers (n = 46). The results are presented in Table 5.

Table 6

Current Role at the String Project

	Frequency	Percent	Cumulative Percent
Director	16	21.3	21.3
Master Teacher	7	9.3	30.7
String Project Teacher (Graduate Student)	6	8.0	38.7
String Project Teacher (Undergraduate Student)	46	61.3	100.0
Total	75	100.0	

Question 6 on the demographic section of the survey asks, "I have also been: (check all that applies)." I included 5 statements for the participants to choose from including 1) String Project director or other administrator, 2) master teacher, 3) undergraduate String Project teacher, 4) graduate String Project teacher, 5) no other roles. The results revealed 11 categories presented in Table 6 for additional/past roles. The majority of the participants (n = 41) indicated that they have not served other roles at the String Project, while the rest of the participants (n = 34) have served more than one role. The results are presented in Table 6.

Table 7

Shows participants' additional role(s) at the String Project

I have also been	Frequency	Percentage
Master Teacher	9	12.0
Master Teacher, String Project Teacher (Undergraduate Student)	1	1.3
No other roles in the String Project	41	54.7
String Project director	3	4.0
String Project director, Master Teacher	3	4.0
String Project director, No other roles in the String Project	1	1.3
String Project director, String Project Teacher (Graduate Student)	1	1.3
String Project director, String Project Teacher (Undergraduate Student)	4	5.3
String Project Teacher (Undergraduate Student)	9	12.0
String Project Teacher (Undergraduate Student), No other roles in the String Project	1	1.3
String Project Teacher (Undergraduate Student), String Project Teacher (Graduate Student)	2	2.7
Total	75	100.0

Question 9 asks, "How long have you been teaching at the String Project?" Participants responded to this question choosing one of the following five statements: 1) 1–2 semesters, 2) 3–4 semesters, 3) 5–6 semesters, 4) 7–8 semesters, and 5) more than 8 semesters. The descriptive statistics indicate that the majority of the participants 38.7% (*n* = 29) have 1–2 semesters of teaching within the String Project. This is to be expected since most of the participants are undergraduate students. Additionally, 24% of the participants (*n* = 18) indicated having more than eight semesters in the String Project. The results are presented in Table 7.

Table 8

Including this semester, how long have you been teaching in the String Project

	Frequency	Percent	Cumulative Percent
1–2 semesters	29	38.7	38.7
3–4 semesters	12	16.0	54.7
5–6 semesters	13	17.3	72.0
7–8 semesters	3	4.0	76.0
More than 8 semesters	18	24.0	100.0
Total	75	100.0	

I also asked the participants to indicate how many years of music-teaching experience they had outside of the String Project. I designed the question with 22 statements, allowing the participants to choose from less than one year to 39–40 years.

Those who selected “no music teaching experience outside of the String Project” are included on the top of Table 7. The results indicate that 5.3% (*n* = 4) have no music teaching experience outside of the String Project. Furthermore, approximately 28% of the participants (*n* = 21) have less than one year of teaching experience followed by 1–2 years 18.7% (*n* = 14), followed by 3–4 years of music teaching experience 14.7% (*n* = 11). The results are presented in Table 8.

Table 9

Years of teaching experience outside the String Project

	Frequency	Percent
No teaching experience outside of the String Project	4	5.3
Less than 1 year	21	28.0
1 -2 years	14	18.7
3 - 4 years	11	14.7
5 - 6 years	1	1.3
7 - 8 years	2	2.7
9 - 10 years	1	1.3
11 - 12 years	2	2.7
15 - 16 years	1	1.3
17 - 18 years	2	2.7
19 - 20 years	3	4.0
27 - 28 years	1	1.3
29 - 30 years	1	1.3
31 - 32 years	1	1.3
33 - 34 years	3	4.0
35 - 36 years	3	4.0
37 - 38 years	1	1.3
39 - 40 years	3	4.0
Total	75	100.0

Research Questions

In this section, I address the research questions using the survey data. Upon creating the ranking lists for the four participant groups, I noticed that some of the groups' ranking lists contained tied rankings. In an effort to avoid tied rankings, I used SPSS to provide the mean for each item to six decimal places and found no differences in mean scores or standard deviations. I then constructed each of the ranking lists taking tied rankings into consideration. The number on the far left of each ranking list represents the order in which SPSS generated each list. I then grouped all statements that have the same ranking and generated a second ranking order with the tied rankings.

Q1. What are the skills and behaviors that String Project directors deem most important for successful string project teaching?

Using a five-point Likert-type scale, the participants rated each statement of skills and behaviors on the survey, with five being very important and one being less important. Using descriptive statistics, I examined the skills and behaviors that String Project directors ranked highest and lowest among the 40 items on the survey. The results are presented in Table 9. The first column represents the ranking order of the items on the survey, while the second column shows the skills and behaviors. The designation column shows which category of skills and behaviors the item belongs to. The last two columns illustrate the mean and standard deviation for each item.

Directors (n = 16) ranked "Give clear instructions" the highest (M = 4.94) with a standard deviation of .25. The String Project directors also ranked "Maximize time on task" second (M = 4.88) with a standard deviation of .34, and "Be knowledgeable of

subject matter third (M = 4.81) with a standard deviation of .40. On the other hand, "Possess excellent sight-reading skills" (M = 3.94), "Possess competent conducting gestures" (M = 3.56), and, "Possess proficient piano skills" (M = 3.13) sit on the bottom of the table.

Table 10

String Project directors means and rankings for the 40 skills and behaviors on the survey

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
1	1	Give clear instructions	P	4.94	.25
2	2	Maximize time on task	P	4.88	.34
3	3	Be knowledgeable of subject matter	T	4.81	.40
4	4	Be mature and have self-control	P	4.75	.45
5		Employ a positive approach	P	4.75	.45
6		Possess aural skills	M	4.75	.45
7		Maintain high musical expectations	M	4.75	.45
8		Develop positive rapport with the students	P	4.75	.45
9	5	Be enthusiastic, energetic	P	4.69	.48
10		Maintain a high level of professionalism	P	4.69	.60
11		Be able to motivate students	P	4.69	.48
12		Be flexible and adaptable	P	4.69	.48
13		Maintain an effective pace	T	4.69	.60
14		Display a high level of musicianship	M	4.69	.60
15	6	Be patient	P	4.63	.62
16		Be organized	P	4.63	.50
17		Be goal-oriented	P	4.63	.50
18		Display confidence	P	4.63	.50
19	7	Be able to work with students of different ages and abilities	T	4.56	.63
20		Be able to present a lesson with clarity	T	4.56	.63
21		Maintain effective time management	T	4.56	.63
22	8	Maintain student behavior (strong, but fair discipline)	T	4.50	.63
23		Frequently make eye contact with students	T	4.50	.63
24		Manage stress well	P	4.50	.73
25	9	Involve students in the learning process	T	4.44	.63
26		Possess strong leadership skills	P	4.44	.89
27		Use effective physiological communication (body language)	P	4.44	.81

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
28		Employ a variety of materials/activities within a lesson	T	4.44	.63
29	10	Incorporate singing when teaching	M	4.38	.72
30		Possess an understanding of teaching/learning strategies	T	4.38	.89
31		Possess good lesson planning skills	T	4.38	.72
32		Employ creative teaching techniques	P	4.38	.81
33	11	Move around the classroom	T	4.31	.79
34		Possess musical knowledge (theory, history, etc.)	M	4.31	.87
35	12	Have a pleasant affect; sense of humor	P	4.13	.62
36		Be knowledgeable and proficient with secondary instruments	M	4.13	.89
37	13	Handle routine repairs (change broken strings, adjust the bridge...etc)	T	4.00	.63
38	14	Possess excellent sight-reading skills	M	3.94	1.06
39	15	Possess competent conducting gestures	M	3.56	.89
40	16	Possess proficient piano skills	M	3.13	1.20

Note. P = Personal skills and behaviors Total number of S.P directors = 16

T = Teaching Skills and behaviors

M = Musical skills and behaviors

Q2. What are the skills and behaviors that String Project master teachers deem most important for successful String Project teaching?

I used descriptive and exploratory statistics to examine which of the 40 items on the survey were ranked highest and which were ranked lowest by the master teachers (n = 7). The results are presented in Table 10. Master teachers ranked 15 items highest (M = 5.00, SD = .00). Many items on the ranking list have identical scores and standard deviation. It is likely that the small number of master teachers affected the scores for each item.

Additionally, six of the last seven items on the list are musical skills and behaviors with "be knowledgeable and proficient with secondary instruments" ranked 35th (M = 4.29, SD =.76), "possess musical knowledge (theory, history, etc.)" (M = 4.14, SD = .69), "incorporate singing when teaching" (M = 4.00, SD = .82), "possess excellent sight-reading skills" (M = 4.00, SD = 1.00), "possess competent conducting gestures" (M = 3.43, SD = 1.27), and "possess proficient piano skills" last (M = 3.14, SD = 1.21).

Table 11

String Project master teachers means and rankings for the 40 skills and behaviors on the survey

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
1	1	Give clear instructions	P	5.00	.00
2		Be able to motivate students	P	5.00	.00
3		Be knowledgeable of subject matter	T	5.00	.00
4		Be flexible and adaptable	P	5.00	.00
5		Maintain an effective pace	T	5.00	.00
6		Be mature and have self-control	P	5.00	.00
7		Be patient	P	5.00	.00
8		Be able to work with students of different ages and abilities	T	5.00	.00
9		Employ a positive approach	P	5.00	.00
10		Maximize time on task	P	5.00	.00
11		Be enthusiastic, energetic	P	5.00	.00
12		Possess aural skills	M	5.00	.00
13		Maintain effective time management	T	5.00	.00
14		Maintain a high level of professionalism	P	5.00	.00
15		Maintain high musical expectations	M	5.00	.00
16	2	Display confidence	P	4.86	.38
17		Be able to present a lesson with clarity	T	4.86	.38
18		Develop positive rapport with the students	P	4.86	.38
19		Involve students in the learning process	T	4.86	.38
20		Move around the classroom	T	4.86	.38
21	3	Manage stress well	P	4.71	.49
22		Possess an understanding of teaching/learning strategies	T	4.71	.49
23		Maintain student behavior (strong, but fair discipline)	T	4.71	.49
24		Be organized	P	4.71	.49

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
25		Frequently make eye contact with students	T	4.71	.49
26	4	Use effective physiological communication (body language)	P	4.57	.79
27		Display a high level of musicianship	M	4.57	.79
28		Employ a variety of materials/activities within a lesson	T	4.57	.53
29		Possess strong leadership skills	P	4.57	.53
30		Be goal-oriented	P	4.57	.53
31	5	Possess good lesson planning skills	T	4.43	.53
32		Have a pleasant affect; sense of humor	P	4.43	.53
33		Employ creative teaching techniques	P	4.43	.53
34	6	Handle routine repairs (change broken strings, adjust the bridge, etc.)	T	4.29	.49
35		Be knowledgeable and proficient with secondary instruments	M	4.29	.76
36	7	Possess musical knowledge (theory, history, etc.)	M	4.14	.69
37	8	Incorporate singing when teaching	M	4.00	.82
38		Possess excellent sight-reading skills	M	4.00	1.00
39	9	Possess competent conducting gestures	M	3.43	1.27
40	10	Possess proficient piano skills	M	3.14	1.21

Note. P = Personal skills and behaviors, Total number of master teachers = 7

T = Teaching Skills and behaviors

M = Musical skills and behaviors.

Q3. What are the skills and behaviors that undergraduate String Project teachers deem most important for successful String Project teaching?

To answer this research question, I created a table with the undergraduate teachers' ranking order and calculated the means, and standard deviations for each of the 40 items on the survey. The results are presented in Table 11. Similar to directors and

master teachers, undergraduate string teachers ranked "give clear instructions" first (*M* = 4.89, *SD* = .43), followed by "involve students in the learning process" (*M* = 4.89, *SD* = .31) and "be able to motivate students" third (*M* = 4.87, *SD* =.34). The first of the musical skills and behaviors, "possess aural skills," was ranked 13th on the list.

Furthermore, five of the six lowest-ranked skills and behaviors ranked by the undergraduate string teachers were musical: "incorporate singing when teaching" (*M* = 4.09, *SD* = .98), "be knowledgeable and proficient with secondary instruments" (*M* = 3.83, *SD* = 1.06), "possess excellent sight-reading skills" (*M* = 3.83, *SD* = 1.04), "move around the classroom" (*M* = 3.78, *SD* = 1.15), "possess competent conducting gestures" (*M* = 3.43, *SD* = 1.22), and "possess proficient piano skills" last (*M* = 3.04, *SD* = .97).

Table 12

String Project undergraduate teachers means and rankings for the 40 skills and behaviors on the survey

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
1	1	Give clear instructions	P	4.89	.43
2		Involve students in the learning process	T	4.89	.31
3	2	Be able to motivate students	P	4.87	.34
4	3	Be mature and have self-control	P	4.85	.36
5	4	Be knowledgeable of subject matter	T	4.83	.38
6		Be flexible and adaptable	P	4.83	.53
7	5	Be patient	P	4.80	.45
8		Display confidence	P	4.80	.45
9	6	Be able to work with students of different ages and abilities	T	4.78	.55
10	7	Be able to present a lesson with clarity	T	4.76	.60
11		Maintain effective time management	T	4.76	.43
12		Develop positive rapport with the students	P	4.76	.43
13	8	Employ a positive approach	P	4.74	.49
14	9	Maximize time on task	P	4.67	.52
15	10	Manage stress well	P	4.65	.57
16	11	Maintain an effective pace	T	4.63	.61
17		Be enthusiastic, energetic	P	4.63	.61

18	12	Possess an understanding of teaching/learning strategies	T	4.61	.58
19	13	Possess aural skills	M	4.57	.62
20	14	Possess strong leadership skills	P	4.54	.81
21	15	Have a pleasant affect; sense of humor	P	4.52	.62
22		Be organized	P	4.52	.81
23	16	Maintain a high level of professionalism	P	4.48	.84
24	17	Maintain high musical expectations	M	4.46	.81
25	18	Use effective physiological communication (body language)	P	4.43	.62
26	19	Display a high level of musicianship	M	4.41	.72
27		Maintain student behavior (strong, but fair discipline)	T	4.41	.75
28	20	Be goal-oriented	P	4.39	.95
29	21	Handle routine repairs (change broken strings, adjust the bridge...etc)	T	4.37	.77
30		Frequently make eye contact with students	T	4.37	.77
31		Employ creative teaching techniques	P	4.37	.68
32	22	Possess musical knowledge (theory, history, etc.)	M	4.35	.82
33	23	Possess good lesson planning skills	T	4.28	.78

34	24	Employ a variety of materials/activities within a lesson	T	4.24	.77
35	25	Incorporate singing when teaching	M	4.09	.98
36	26	Be knowledgeable and proficient with secondary instruments	M	3.83	1.06
37		Possess excellent sight-reading skills	M	3.83	1.04
38	27	Move around the classroom	T	3.78	1.15
39	28	Possess competent conducting gestures	M	3.43	1.22
40	29	Possess proficient piano skills	M	3.04	.97

Note. P = Personal skills and behaviors, Total number of undergraduate string teachers = 46.

T = Teaching Skills and behaviors

M = Musical skills and behaviors.

Q4. What are the skills and behaviors that graduate student String Project teachers deem most important for successful string project teaching?

Using descriptive statistics, I constructed a table containing the means, standard deviations, and ranking order for each of the 40 items for the graduate string teachers. The results are displayed in Table 12. The graduate string teachers ranked 8 items as equally most important (M = 5.00, SD = .00): "give clear instructions," "be able to motivate students," and "be knowledgeable of subject matter" (M = 5.00, SD = .00). A number of items on the ranking list have identical mean scores. This is may be due to the small group size of graduate string teachers (n = 6).

The graduate string teachers ranked most of the musical skills and behaviors lower including, " possess competent conducting gestures" 5th (M = 4.33, SD = .82), both "maintain high musical expectations" (M = 4.00, SD = 1.10), and "move around the

classroom" 6th (4.00, *SD* = 1.10), "possess excellent sight-reading skills" 7th (*M* = 3.83, *SD* = .98), and "possess proficient piano skills" last (*M* = 2.83, *SD* = 1.72).

Table 13

String Project graduate student teachers means and rankings for the 40 skills and behaviors on the survey

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
1	1	Give clear instructions	P	5.00	.00
2		Be able to motivate students	P	5.00	.00
3		Be knowledgeable of subject matter	T	5.00	.00
4		Be flexible and adaptable	P	5.00	.00
5		Display confidence	P	5.00	.00
6		Be able to present a lesson with clarity	T	5.00	.00
7		Maintain an effective pace	T	5.00	.00
8		Possess good lesson planning skills	T	5.00	.00
9	2	Be mature and have self-control	P	4.83	.41
10		Be patient	P	4.83	.41
11		Be able to work with students of different ages and abilities	T	4.83	.41
12		Develop positive rapport with the students	P	4.83	.41
13		Employ a positive approach	P	4.83	.41
14		Maximize time on task	P	4.83	.41
15		Manage stress well	P	4.83	.41
16		Be enthusiastic, energetic	P	4.83	.41
17		Possess aural skills	M	4.83	.41
18		Be organized	P	4.83	.41
19		Employ a variety of materials/activities within a lesson	T	4.83	.41
20	3	Involve students in the learning process	T	4.67	.52
21		Maintain effective time management	T	4.67	.52
22		Have a pleasant affect; sense of humor	P	4.67	.82
23		Use effective physiological communication (body language)	P	4.67	.52
24	4	Possess an understanding of teaching/learning strategies	T	4.50	.84
25		Possess strong leadership skills	P	4.50	.55
26		Display a high level of musicianship	M	4.50	.84

Rank	Tied Ranking	Skills and Behaviors	Designation	Mean	Std. Deviation
27		Maintain student behavior (strong, but fair discipline)	T	4.50	.55
28		Handle routine repairs (change broken strings, adjust the bridge...etc)	T	4.50	.55
29		Possess musical knowledge (theory, history, etc.)	M	4.50	.55
30		Incorporate singing when teaching	M	4.50	.84
31		Be knowledgeable and proficient with secondary instruments	M	4.50	.84
32	5	Maintain a high level of professionalism	P	4.33	1.63
33		Be goal-oriented	P	4.33	1.21
34		Frequently make eye contact with students	T	4.33	.52
35		Employ creative teaching techniques	T	4.33	.82
36		Possess competent conducting gestures	M	4.33	.82
37	6	Maintain high musical expectations	M	4.00	1.10
38		Move around the classroom	T	4.00	1.10
39	7	Possess excellent sight-reading skills	M	3.83	.98
40	8	Possess proficient piano skills	M	2.83	1.72

Note. P = Personal skills and behaviors, Total number of graduate students = 6

T = Teaching Skills and behaviors

M = Musical skills and behaviors.

Q5. Are there any differences in the three categories of skills and behaviors deemed important according to role in the Project?

I started my analysis by calculating whether or not there were differences in perspectives between the broad categories of skills and behaviors among the four groups of participants: directors, master teachers, graduate string teachers, and undergraduate string teachers. I calculated the means for each of the three broad categories of skills and behaviors for each participant group. I then conducted a one-way MANOVA using the three broad categories of skills and behaviors (personal, teaching, and musical skills and behaviors) as dependent variables with the four participant groups as levels of the independent variable.

Prior to conducting any inferential statistical procedures, I examined the assumptions needed to conduct MANOVA. I used QQ plots for personal, teaching, and musical skills and behaviors to verify normally distributed data in all three categories (See Appendices I, J, K). The Box's M test of equality of covariances matrices showed significant differences between the matrices of the covariance (Box's M value = 1.89, $p = .015$) based on alpha level of $p = .05$. However, Huberty and Petoskey (2000) indicated that both the Bartllet and Box's M tests are extremely powerful tests and they recommended proceeding with the MANOVA if the p value of the F test for Box's M is higher than .005. Similarly, Russell (2018) suggested that even if the Box's M came out significant at alpha level $p = .05$, the analysis is not necessarily flawed and, in most cases, should not be abandoned. Russell indicated that Box's M test of homogeneity is very conservative and the MANOVA is a robust statistical procedure if paired with roughly the same number of participants in each cell and/or a large total sample size. Thus, based

on Huberty and Petoskey (2000) and Russell (2018) suggestions, the assumption of homogeneity has not been violated at alpha level $p = .005$.

The results of the first one-way MANOVA showed no significant differences using Pillai's Trace in perspectives of the three broad categories of skills and behaviors (teaching, personal, and musical) between the groups (directors, master teachers, graduate string teachers, undergraduate string teachers), V = .14, $F = (9, 213) = 1.15$, $p = .33$. This indicates that the four groups do not have different means among the skills and behaviors even when evaluating the three broad categories of skills and behaviors simultaneously.

Table 13 shows the means for each of the three broad categories of skills and behaviors for the four participant groups. The table shows that the overall mean for musical skills and behaviors received the lowest ranking ($M = 4.07$) compared to personal and teaching skills and behaviors, while personal skills and behaviors received the highest ranking mean ($M = 4.67$). Additionally, teaching skills and behaviors received slightly lower ranking mean than personal and skills and behaviors ($M = 4.54$). Also, from Table 12, we can see that the ranked means for the master teachers and the graduate String Project teachers are very similar across the three broad categories of skills and behaviors.

Table 14

Means of the three categories of skills and behaviors and the standard deviations for 4 participant groups

	Current Role at the String Project	*Mean*	*Std. Deviation*	*N*
Teaching Mean	S.P Director	4.47	.48	16
	S.P Master Teacher	4.76	.17	7
	Graduate Student S.P Teacher	4.68	.23	6
	Undergraduate Student S.P Teacher	4.52	.41	46
	Total	4.54	.40	75
Personal Mean	S.P Director	4.62	.40	16
	S.P Master Teacher	4.81	.12	7
	Graduate Student S.P Teacher	4.75	.23	6
	Undergraduate Student S.P Teacher	4.65	.36	46
	Total	4.67	.34	75
Music Mean	S.P Director	4.18	.54	16
	S.P Master Teacher	4.17	.36	7
	Graduate Student S.P Teacher	4.20	.55	6
	Undergraduate Student S.P Teacher	4.00	.58	46
	Total	4.07	.55	75

Note. S.P = String Project.

I also collapsed the four groups of participants into three, grouping the master teachers and graduate string teachers together in order to reduce the differences in group sample sizes. Following that, I conducted an additional MANOVA with the new groupings. The results of the MANOVA yielded no different practical results than the former analysis V = .13, $F = (6, 142) = 1.66$, $p = .14$.

Q6. Are there any differences between the perspectives of the graduate and undergraduate string teachers regarding the three broad categories of skills and behaviors that they deem necessary according to their semesters of teaching in the String Project?

To answer this question, I conducted a second one-way MANOVA with the three broad categories as dependent variables and the teaching experience within the String Project as an independent variable. The Box's M test of homogeneity of covariances matrices shows no significant differences between the matrices of the covariances (Box's M value = 12.11, $p = .16$).

The result of the one-way MANOVA using Pillai's Trace indicates no significant differences in perspectives of the three broad categories of skills and behaviors (teaching, personal, and musical) between the groups (directors, master teachers, graduate string teachers, undergraduate string teachers), V = .02, $F = (3, 48) = .32$, $p = .81$. This indicates that there are no statistically significant differences in perspectives between the three broad categories of skills and behaviors among both graduate and undergraduate string teachers.

Although the result of the one-way MANOVA shows no statistically significant differences between graduate and undergraduate String Project teachers, we can still observe differences in perspectives between the two groups according to their response means for each of the three categories of skills and behaviors. Looking at the grand means for the three categories of skills and behaviors, Table 14 indicates that personal skills and behaviors received the highest-ranking mean ($M = 4.66$), followed by teaching

skills and behaviors (*M* = 4.54), and musical skills and behaviors (*M* = 4.02). Comparing the responses of both graduate and undergraduate String Project teachers, we can also see that the graduate String Project teachers have slightly higher ranking means for all three categories of skills and behaviors. This difference in perspective may be due to the large difference in cell sizes between the two groups, with graduate sting teachers cell size (*n* = 6) and undergraduate string teachers cell size (*n* = 46).

Table 15

Means of teaching, music, and personal skills and behaviors for the graduate and undergraduate String Project teachers

	Current Role at the String Project	Mean	Std. Deviation	N
Teaching Mean	Graduate Student S.P Teacher	4.68	.23	6
	Undergraduate Student S.P Teacher	4.52	.41	46
	Total	4.54	.39	52
Music Mean	Graduate Student S.P Teacher	4.20	.55	6
	Undergraduate Student S.P Teacher	4.00	.58	46
	Total	4.02	.57	52
Personal Mean	Graduate Student S.P Teacher	4.75	.23	6
	Undergraduate Student S.P Teacher	4.65	.36	46
	Total	4.66	.35	52

Note. S.P = String Project.

Q7. Are there any relationships between music teaching experience outside of the String Project and the means of the three broad categories of skills and behaviors?

To examine this question, I constructed a Pearson Product-Moment Correlation matrix to determine whether or not relationships exist between music teaching experience outside of the String Project and the means of personal skills and behaviors, teaching skills and behaviors, musical skills and behaviors. A summary of those results is shown in Table 15.

The results of the Pearson Correlation indicate no statistically significant relationship between music experience outside the String Project and the mean for teaching skills and behaviors ($r = .05$, $p = .66$), teaching experience outside the String Project and musical skills and behaviors ($r = .14$, $p = .24$), or teaching experience outside of the String Project and personal skills and behaviors ($r = .05$, $p = .67$).

However, the results of the Pearson Product-Moment Correlation indicate a strong positive relationship between musical skills and behaviors and teaching skills and behaviors ($r = .78$, $p = .00$), a strong positive relationship between musical skills and behaviors and personal skills and behaviors ($r = .65$, $p = .00$), and strong relationship between personal skills and behaviors and teaching skills and behaviors ($r = .84$, $p = .00$). Some of the statements have an underlying meaning for the individual participants, which may be indicative of a crossover effect between the three broad categories of teaching skills and behaviors, personal skills and behaviors, and musical skills and behaviors.

Table 16

Relationship between music teaching experience outside of the String Project and the grand means for teaching, musical, and personal skills and behaviors

		Experience Outside	Teaching Mean	Music Mean	Personal Mean
Experience Outside	Pearson Correlation	1			
	Sig. (2-tailed)				
Teaching Mean	Pearson Correlation	.05	1		
	Sig. (2-tailed)	.66			
Music Mean	Pearson Correlation	.14	.78**	1	
	Sig. (2-tailed)	.24	.00		
Personal Mean	Pearson Correlation	.05	.84**	.65**	1
	Sig. (2-tailed)	.67	.00	.00	

**. Correlation is significant at the 0.01 level (2-tailed).

Total number of participants $N = 75$.

Q8. Are there any differences in perspectives by age, gender, or academic major?

My first plan was to run a factorial ANOVA with the three independent variables, age, gender, and academic major to find whether or not there were significant differences or interactions between the three variables. However, due to the small cell sizes in each participant group, it was difficult to detect statistical significance given the cell size needed to test each of three variables. I considered non-parametric statistics such Kruskill Wallis, or Mann Whitney procedures; however, to do this, the data would need to be reduced to fewer levels, which would not yield meaningful results.

Discussion

In this study, I adapted and modified Teachout's (1997) 40-item survey to match the context of my research questions. Some of the previous studies that adapted Teachout's survey also employed his analysis procedure. Teachout's analysis included categorizing the 40 items of skills and behaviors into three broad categories: personal skills and behaviors, teaching skills and behaviors, and musical skills and behaviors. Most of the studies that I found, including the current study, followed the same procedure of categorizing the items on the survey. Edelman (2016) and Moss (2007) indicated that some of the items on the survey had more than one meaning and therefore it was necessary to split some of the items into two statements. In other instances, Edelman eliminated some of the statements that did not comply with the context of his study. Additionally, Edelman found that some items on his modified survey were designated differently than Teachout's original survey. For the current study, I modified some of the original statements to match the context of the research. A discussion of the modifications I made to some of the items on the original survey can be found in Chapter

3 (see Appendix A). It is worth noting that due to the necessary modifications I made to some of the items on the survey, the designation of some of the modified items is different than Teachout's original statements.

In the current study, I employed several statistical procedures to analyze the data; however, I used different inferential statistics procedures than the original Teachout's (1997) original methodology and successor studies adapting Teachout's 40-item survey. To further investigate the relationship between the three broad categories and the rating of the four groups of participants. I constructed additional ranking lists for each of the three categories of skills and behaviors. In the additional ranking lists for the three broad categories, I rearranged the ranking of each of the 40 skills and behaviors based on their designation. Each of the new ranking lists contains the ranking of the four participant groups for each item of personal, teaching, and musical skills and behaviors.

Teachout and some of the researchers that adapted his survey employed a repeated-measure analysis of variance as their primary statistical procedure to determine whether or not there were differences in perspectives between the participants' groups. Repeated-measure analysis of variance is usually employed to determine whether or not there is a significant difference between the groups, examining a single dependent variable over time. ANOVA in all of its forms is a univariate test. This means that it can handle only one dependent variable with one or more independent variables or level of variable(s). When using ANOVA, the dependent variable usually measures the same phenomena under different conditions or different times. This means that a one-way repeated-measure ANOVA incorporates the correlation between the repeated measures to

determine whether or not there are statistical differences between the dependent variables.

Multivariate analysis of variance (MANOVA), on the other hand, is used to compare two or more dependent variables for one or more groups. Thus, MANOVA is more appropriate for this study. The differences between the two inferential statistical procedures are discussed further in the analysis section of Chapter 3. I conducted several MANOVAs to determine whether or not there were statistically significant differences in perspectives between the four groups of participants using the three broad categories of skills and behaviors as dependent variables. I also combined master teachers and graduate string teachers to determine whether or not the small cell size of the master teachers and graduate string teachers affected the outcome of the test. The results showed no significant differences in perspectives whether master teachers and graduate string teachers were combined or not. Furthermore, the results of the one-way MANOVA indicated no significant differences between graduate and undergraduate string teachers, however, the descriptive data show differences in ranking of the 40 items among String Project directors, master teachers, graduate and undergraduate string teachers, which will be discussed in the following section.

Comparison between rankings of the four groups of participants

In all four groups of participants, several statements from the 40-item list received tied rankings. I have included two ranking orders in each table; one directly imported from SPSS and the other one accounting for the tied ranking. Taking the tied ranking into consideration resulted in 16 ranking order for the directors, 10 for the master teachers, 8 for the graduate string teachers, and finally, 29 for the undergraduate string teachers. The

tied rankings may be due in part to the difference in cell sizes between the participant groups. The relatively small cell sizes for the master teachers and graduate string teachers compared to the undergraduate string teachers and directors may also have contributed to having tied rankings. The standard deviations in all four participant groups for most the 40 statements indicate that most of the scores are clustered around the mean and fall within one standard deviation from the mean. This indicates that there is not enough variability in the scores to detect significant differences MANOVA. This is also reflected in the descriptive statistics as the ranking tables show small variation between the 40 items among the four participant groups.

Tied rankings sorted by the three broad categories of skills and behaviors

Following creating a ranking list based on the four participants groups and the order of ranking of the 40 items on the survey, I also constructed three additional tables, which displayed the personal, teaching, and musical skills and behaviors, each in a separate ranking order (See tables 16, 17, and 18). Arranging each of the three broad categories individually resulted in new rankings for each participant group, although the original order of the statements did not change. In the new lists, the personal skills and behaviors category contained 10 raking orders for the directors, 6 for the master teachers, 4 the graduate string teachers, and 14 ranking orders for the undergraduate string teachers. The teaching skills and behaviors contained 8 ranking orders for directors, 6 for both master and graduate teachers, and 12 for undergraduate string teachers. The category of musical skills and behaviors received 8 rankings for the director group, 7 for both master and graduate teachers, and 9 for undergraduate string teachers.

Among the personal skills and behaviors list, 13 of 18 statements on the list have ranking disparities of 5 or more ranking orders between the four groups. The three statements on the personal skills and behaviors list; "Give clear instructions," "Maximize time on task," and "Be mature and have self-control" are ranked equally or within two ranking orders of each other. Results are presented in Table 17.

Among the teaching skills and behaviors statements, the five statements; "Be knowledgeable of subject matter," "Maintain an effective pace," "Be able to work with students of different ages and abilities," and "Maintain student behavior (strong, but fair discipline)" are ranked equally or within two ranking orders apart. The statements "Involve the students in the learning process," "Employ a variety of materials/activities within a lesson," "Possess an understanding of teaching/learning strategies," "Possess a good lesson planning skills," "Move around the classroom," and "Handle routine repairs (change broken strings, adjust the bridge…etc.)" have the largest ranking disparity (see Table 18).

In the musical skills and behaviors category, all items were ranked equally or within two ranking orders apart. "Possess aural skills" ranked first by all participants' groups followed by "Maintain high musical expectations" (see Table 19).

Table 17

Rankings sorted by personal of skills and behaviors category

Designation	Statement	Directors	Master Teachers	Graduate String Teachers	Undergraduate String Teachers
P	Give clear instructions	1	1	1	1
P	Maximize time on task	2			2
P	Be mature and have self-control	3			3
P	Employ a positive approach				4
P	Develop positive rapport with the students				5
P	Be enthusiastic, energetic	4		2	6
P	Maintain a high level of professionalism				7
P	Be able to motivate students				
P	Be flexible and adaptable				
P	Be patient	5			8
P	Be organized		2		9
P	Be goal-oriented				
P	Display confidence				10
P	Manage stress well	6	3	3	11
P	Possess strong leadership skills	7	4		12
P	Use effective physiological communication (body language)	8			
P	Employ creative teaching techniques	9	5	4	13
P	Have a pleasant affect; sense of humor	10	6		14
P = personal skills and behaviors category					

Table 18

Ranking for the teaching skills and behaviors category

Designation	Statement	Directors	Master Teachers	Graduate String Teachers	Undergraduate String Teacher
T	Be knowledgeable of subject matter	1	1	1	1
T	Maintain an effective pace	2		2	2
T	Be able to work with students of different ages and abilities	3	2		3
T	Be able to present a lesson with clarity			3	4
T	Maintain effective time management		3		5
T	Maintain student behavior (strong, but fair discipline)	4			6
T	Frequently make eye contact with students				7
T	Involve students in the learning process	5		4	8
T	Employ a variety of materials/activities within a lesson		4		9
T	Possess an understanding of teaching/learning strategies	6			10
T	Possess good lesson planning skills		5		
T	Move around the classroom	7		5	11
T	Handle routine repairs (change broken strings, adjust the bridge...etc)	8	6	6	12
T =teaching skills and behaviors category					

Table 19

Ranking for the musical skills and behaviors category

Designation	Statement	Directors	Master Teachers	Graduate String Teachers	Undergraduate String Teacher
M	Possess aural skills	1	1	1	1
M	Maintain high musical expectations				2
M	Display a high level of musicianship	2		2	3
M	Incorporate singing when teaching	3	2	3	4
M	Possess musical knowledge (theory, history, etc.)	4	3	4	5
M	Be knowledgeable and proficient with secondary instruments	5	4		6
M	Possess excellent sight-reading skills	6	5	5	7
M	Possess competent conducting gestures	7	6	6	8
M	Possess proficient piano skills	8	7	7	9

M = musical skills and behaviors category

Summary of the Chapter

Examining the perspectives of the String Project teachers using one-way MANOVAs revealed no significant differences between the four groups of participants, contrary to previous studies that adapted Teachout's survey. Other existing studies found a statistically significant differences in perspectives of the skills and behaviors important for successful music teaching, or student teaching experience (Edelman, 2016; Moss, 2007). I also examined whether or not significant differences exist in perspectives between graduate and undergraduate string teachers and found no statistically significant

differences using a one-way MANOVA and the three broad categories of skills and behaviors.

Although the results of the MANOVAs show no significant differences in perspectives between the four groups, the descriptive statistics show differences in their ranking of the 40 items. The ranking tables for each group show some tied rankings for some items on the survey. This may be due to the small sample size of this study. When accounting for tied rankings, the results show a different number of tied rankings for each group of participants. Tied rankings resulted in 16 ranking orders (n = 16) for String Project directors, master teachers 10 (n = 7), graduate string teachers 8 (n = 6), and undergraduate string teachers 29 (n = 46). This difference in rankings is due in part to the small cell sizes for three groups.

We can also observe that there are fewer tied rankings when the cell sizes are large and more tied ranking when the cell size is small. The master teachers and graduate string teachers have roughly a similar ranking across all 40 statements. This might be due to the smaller cell sizes compared to the directors and undergraduate string teachers. The directors and undergraduate string teachers have fairly large cell sizes compared to master teachers and graduate string teachers, and it is evident that the two groups differ in their rankings of the 40 statements on the survey. When rearranging the rankings based on the three broad categories of personal, teaching and musical skills and behaviors, my study found consistent results with previous studies that adapted Teachout's survey. Previous studies reported personal skills and behaviors ranked first, followed by teaching skills and behaviors, and musical skills and behaviors comes last (Edelman, 2016; Moss, 2007; Miksza et al., 2010; MacLeod & Walter, 2011).

Chapter Five

Summary, Discussion, and Implications

This chapter provides a summary and discussion of the results of the current study, presents some recommendations for practices, and suggestions for future research.

Summary of the Study

This study examined the perspectives of String Project directors, master teachers, graduate, and undergraduate string teachers regarding the skills and behaviors necessary for successful string teaching. I adapted an existing survey from Teachout (1997), developed to examine the opinions of experienced and preservice music teachers regarding the skills and behaviors important for teaching music. To match the context of my research criteria, I modified some of the items on the original study and pilot-tested the modified survey with eight music education experts.

I identified potential participants through the National String Project Consortium website. I created a database containing information about each of the 40 String Projects across the United States and contact information of String Project directors and master teachers (see Appendix E). I then sent out an electronic cover letter explaining the intent of the study and asked the directors and master teachers to complete the survey and to forward the invitation letter containing a link to the electronic survey to their graduate and undergraduate String Project teachers who were 18 or older and spoke fluent English. I received 75 completed surveys but could not determine the response rate, because I do not know the actual number of teachers that received the survey. Using a five-point Likert-type scale, the participants rated each of the 40 items on the survey based on its importance in their teaching. In addition to the 40 statements pertaining to the skills and

behaviors important for teaching strings, I also collected demographic information such age, gender, current and past role(s) at the String Project, years of music teaching experience within and outside of the String Project, and the academic major and degree(s) attained or currently working on at the time of completing the survey.

Using SPSS statistical software, I calculated the means for each survey statement for all participant groups. I then grouped all the skills and behaviors designated as personal, teaching, and musical skills and behaviors in three separate groups, and calculated the grand mean for each group of skills and behaviors. To determine how each participant group ranked each of the 40 statements on the survey, I constructed four tables with descriptive statistics, showing the rankings of each skills and behaviors statement, the mean, and standard deviation for each participants' group. I found that each participant group had different rankings for some of the 40 items on the survey, although the order of the statements was similar. To further investigate how each category of skills and behaviors ranked in each group, I constructed three additional ranking lists. Each list contains one of the three broad categories of skills and behaviors with new ranking orders.

I first examined whether or not there were statistical differences in perspectives among the four groups of participants regarding the skills and behaviors each group deemed important for teaching at the String Project. I conducted a one-way multivariate analysis of variance (MANOVA) with the participant groups as the independent variable with four levels: directors (n = 16), master teachers (n = 7), graduate string teachers (n = 6), and undergraduate string teachers (n = 46) and teaching, personal, and musical skills and behaviors as the dependent variables. The results of the one-way MANOVA showed

no statistically significant differences in perspective regarding the skills and behaviors important for teaching strings across all participant groups. This demonstrates that the means for the four participant groups were not statistically different given the size of each participant group and the number of dependent variables.

To determine whether or not the group sizes affected the results of the inferential statistical procedure, I combined the master teachers and graduate string teachers and conducted an additional one-way MANOVA with the new groupings; directors (n = 16), master teachers and graduate string teachers (n = 13), and the undergraduate string teachers (n = 46). I also used the three broad categories of skills and behaviors as the dependent variables. The results yielded no different practical results than the former one-way MANOVA.

To further investigate whether or not there existed a statistical difference in perspectives of the important skills and behaviors among graduate and undergraduate string teachers, I conducted a third one-way MANOVA, examining only these two groups of string teachers as the predictor variable with two levels, and the three broad categories of skills and behaviors as the dependent variables and found no statistically significant differences between graduate and undergraduate string teachers' perspectives regarding the skills and behaviors they deemed important for teaching strings.

When examining the perspectives of String Project teachers regarding which of the three broad skills and behaviors categories String Project teachers deemed important using inferential statistics, the findings of the current study suggest that there are no significant statistical differences between the three broad categories among the four participant groups. This is contrary to the findings of some of the previous studies that

examined the three broad categories of skills and behaviors (Davis, 2006; Edelman, 2016; Teachout, 1997); however, MacLeod and Walter (2011) also found similar means and standard deviations for personal, teaching and musical categories. These discrepancies in findings can be attributed to various factors, which will be discussed further in this chapter.

Discussion of Survey Rankings

When examining the ranking lists for each participant group, I observed that each group ranked some skills and behaviors statements differently. Generally, most of the items designated as personal skills and behaviors ranked higher on the ranking lists for all participant groups, followed by teaching and musical skills and behaviors, although the one-way MANOVA indicated no statistical differences between the skills categories. I placed each of the skills and behaviors with tied rankings in ranking groupings. It is difficult to establish a true ranking order for each of the 40 statements, due to the number of tied rankings. The participant group with the least tied rankings was the undergraduate string teachers with five tied rankings, followed by graduate string teachers with six tied rankings, master teachers with seven tied rankings, and directors with nine tied rankings. These tied rankings could be the result of not enough variability in the data due to the small cell sizes of some of the participant groups.

This section will provide an interpretation and rankings comparison between each participant group in the current study, as well as a comparison of findings from Teachout (1997). For consistency, in this section of the chapter, I chose to compare the findings of the current study to Teachout's findings because most of the studies that adapted Teachout's survey modified some of the items on the survey (Edelman, 2016; Moss,

2007). Some of these modifications were made to improve readability of some of the statements, and in some other cases, changed the entire meaning of the statement, making comparisons with other studies difficult.

The tied rankings found the in the results of the current study resulted in different numbers of ranking-order groupings for each participant group. The directors' ranking contained 16 ranking groupings, the master teachers' group contained 10 ranking groupings, graduate string teachers contained 8 ranking groupings, and undergraduate string teachers contained 29 ranking groupings.

Personal Skills and Behaviors

The statement of the personal skills and behaviors, "give clear instructions," was ranked first by all participants' groups; it was the top ranked item by all directors and undergraduate string teachers, and it was in the first grouping for master teachers and graduate teachers. The statement "Maximize time on task" was ranked second by directors (out of 16 ranking orders), in the first grouping (out of 29) for undergraduate string teachers, and also in the first grouping by master and graduate string teachers (out of 10 ranking orders for master teachers and out of 8 ranking orders for graduate string teachers). In Teachout's study, experienced teachers ranked this item 12th, while preservice teachers ranked it 22nd (out of 40).

The statement "Be mature and have self-control" was ranked third (out of 29) by undergraduate string teachers and in the fourth grouping (out of 16) for the directors, while master (out of 10 ranking orders) and graduate string teachers (out of 8 ranking orders) ranked this statement in the first grouping. In Teachout's study, preservice teachers ranked this item 1st while experienced teachers ranked it 7th.

Directors ranked the statement "Employ a positive approach" in the fourth grouping out of 16 ranking orders, undergraduate string teachers also ranked it fourth out of 29 ranking orders, while both master and graduate teachers ranked this statement in the top ranking grouping (out of 10 ranking orders for master teachers and out of 8 for graduate string teachers). In Teachout's study, preservice teachers ranked this item 9th, while experienced teachers ranked it 6th.

The statement "Develop positive rapport with the students" was ranked by both master teachers and graduate string teachers in the first grouping (out of 10 ranking orders for master teachers and out of 8 ranking orders for graduate string teachers), while the directors' ranking for this statement was in the fourth grouping (out of 16); undergraduate string teachers ranked this statement fifth (out of 29). Teachout's preservice teachers ranked this item 27th while experienced teachers ranked it 26th. Davis (2011) found through interviews with String Project teachers, community students, and community students' families, that one of the key elements of the success of the String Project program was the opportunity to engage in music making activities with teachers, friends, and family. Because of the nature of the String Project classes and private lessons, teachers see students and their family members on a regular basis, allowing String Project teachers to build rapport with students and their families on various aspects including: voicing their opinions or concerns regarding musical activities or assignments and allowing them to make decisions about some musical aspects.

Directors ranked "Be enthusiastic, energetic" in the fifth grouping (out of 16); graduate string teachers also ranked this item fifth (out of 8), master teachers in the top-ranking grouping (out of 10), while undergraduate string teachers ranked this statement

6th (out of 29). Teachout found that preservice teachers ranked this item 15th while experienced teachers ranked it 3rd.

The statement of "Maintain a high level of professionalism" was ranked in the fifth grouping by directors (out of 16), in the top grouping by master teachers (out of 10), in the second grouping (out of 8) by graduate string teachers, and 7th (out of 29 groupings) by undergraduate string teachers. Participants in Teachout's study ranked this item within two ranking orders: preservice teachers ranked this item 17th, while experienced teachers ranked it 15th. According to the National String Project Consortium website, one of the goals of establishing String Projects is to provide opportunities for undergraduate and graduate string teachers to develop leadership skills. This may explain why all participant groups ranked high level of professionalism as one of the important aspects of successful string teaching.

Directors ranked the statement "Be able to motive students" in the fifth grouping (out of 16). Master teachers and graduate string teachers ranked it within one ranking order first (out of 10) and second ranking groupings (out of 8), while undergraduate string teachers ranked this statement in the seventh (out of 29) groupings. Participants in Teachout's study ranked this item equally; both preservice and experienced teachers ranked this item 2nd. There seems to be an agreement in both the current study and Teachout's study, that motivating students is among the top priorities for successful music teaching. Davis (2011) suggested that String Project string teachers employ various activities including peer modeling and positive reinforcement to keep their students motivated and eager to learn more.

The statement "be flexible and adaptable" was ranked within 6 ranking orders or less. This statement was ranked in the fifth grouping (out of 16 groupings) by the directors' group, in the top grouping (out of 10) for the master teachers, in the second grouping (out of 8 ranking groupings) for the graduate string teachers, while undergraduate strings teachers ranked this statement in the seventh (out of 29) ranking grouping. It is worth mentioning that the statements, "Maintain a high level of professionalism," "Be able to motivate students," and "Be flexible and adaptable," have the same mean for all four groups of participants. Teachout reported that the statement "be flexible and adaptable" was ranked within one ranking order. Preservice teachers ranked this item 11th while experienced teachers ranked it 12th. This item is designated in the personal skills and behaviors category in both Teachout's and the current study. The findings of the current study indicate that being flexible and adaptable is among the top ten skills and behaviors.

The statement "Be patient" was ranked in the sixth grouping (out of 16) by the directors, in the first ranking grouping by master teachers (out of 10 groupings), in the second grouping (out of 8) for graduate string teachers, while undergraduate string teachers ranked this statement 10th (out of 29). Teachout reported that preservice teachers ranked this statement 19th, while experienced teachers ranked it 7th. In both the current and Teachout's study, experienced teachers seem to value the personal skills and behaviors "Be patient" more than less experienced teachers.

The personal skills and behaviors statement "Be organized" was ranked in the second grouping by master teachers (out of 10 groupings) and graduate string teachers (out of 8), while directors' ranking for this statement was in the sixth grouping (out of

16), and eleventh grouping (out of 29) for undergraduate string teachers. Teachout reported that both preservice and experienced teachers ranked this item within three ranking orders apart. Preservice teachers ranked this item sixth, while experienced teachers ranked it third. In the current study, experienced teachers (directors, master teachers, and graduate string teachers) ranked this item in the top ten items.

"Be goal oriented" received a similar ranking as "Be organized." Directors' ranking for this statement was in the sixth grouping (out of 16), master teachers and graduate string teachers both ranked this statement in the second grouping (out of 10 groupings for master teachers and out of 8 groupings for graduate string teachers), while undergraduate string teachers ranking was in the 11th grouping (out of 29 ranking groupings). In both the current study and Teachout's study, this statement was designated in the group of personal skills and behaviors. Teachout indicated that both preservice and experienced teachers ranked this item within two ranking orders: preservice teachers ranked this item 15th, while experienced teachers ranked it 17th. All groups in both studies ranked this item near the middle of the list.

Directors ranked the statement, "Display confidence" in the sixth ranking grouping (out of 16), undergraduate string teachers ranked this statement 12th (out of 29), while both master teachers and graduate string teachers ranked this statement in the second grouping (out of 10 for master teachers and 8 ranking groupings for graduate string teachers). In Teachout's study, the participants ranked this item within one ranking order: preservice teachers ranked this statement 4th, while experienced teachers ranked it 5th. Davis (2011) suggested that String Project undergraduate string teachers indicated

that the experience they gained throughout the program helped them develop confidence and find their teacher's voice.

Directors ranked the personal statement "Manage stress well" in the eighth grouping (out of 16), master teachers and graduate teachers both ranked this statement within one ranking order; third (out of 10) and fourth (out of 8) ranking groupings respectively, and 17th (out of 29 ranking groupings) in the undergraduate string teachers list. In Teachout's study, both preservice and experienced teachers ranked this statement 19th. It seems that both master teachers and graduate string teachers believe that managing stress and anxiety among the most important skills and behaviors, in contrast to directors and undergraduate string teachers, who ranked this item in the middle of their ranking lists.

The personal skills and behaviors statement, "Possess strong leadership skills," received the same ranking from master and graduate string teachers. Master teachers and graduate string teachers ranked this statement in the fourth grouping (out of 10 ranking groupings for master teachers and 8 ranking groupings for graduate string teachers). It was in the ninth grouping (out of 16) in the directors' group, and the undergraduate string teachers' ranking was 19th (out of 29). It seems that more experienced teachers value strong leadership more than less experienced teachers as directors, master teachers, and graduate string teachers all ranked this statement in the top ten highest ranked statements. Teachout found that both preservice and experienced teachers ranked this item 2nd and 9th respectively, indicating that both participant groups believe that strong leadership is among the most important skills and behaviors for successful music teaching.

The personal skills and behaviors statement, "Use effective physiological communication (body language)," received the same ranking as "Possess strong leadership skills," in the middle of the ranking list for all four groups of participants: directors ranked this statement in the ninth grouping (out of 16), undergraduate string teachers ranked it in the nineteenth grouping (out of 29), while master teachers and graduate string teachers ranked this statement in the fourth ranking grouping (out of 10 ranking groupings for master teachers and out of 8 for graduate string teachers). We can observe that master teachers and graduate string teachers ranked this statement among the top ranked items, while undergraduate string teacher and directors ranked it somewhere in the middle of the ranking lists for each group. In Teachout's study, preservice ranked this item 31st, while experienced teachers ranked this item 34th, near the bottom.

When examining "Employ creative teaching techniques," directors ranked this statement in the tenth ranking grouping (out of 16), undergraduate string teachers towards the bottom of the ranking list, 22nd (out of 29), while master teachers and graduate string teachers' rankings were similar, in the fifth grouping (out of 10 for master teachers and out of 8 for graduate string teachers. Teachout reported that the statement "Be creative, imaginative, and spontaneous," the equivalent of "Employ creative teaching techniques," was ranked 19th by preservice teachers and 30th by experienced teachers.

The statement "have a pleasant affect: sense of humor" received a large ranking disparity among the four groups of participants. The smallest ranking disparity was between master teachers and graduate string teachers. Master teachers ranked this statement in the sixth (out of 10 ranking groupings) ranking grouping, while graduate string teachers ranked it in the fifth (out of 8) grouping. The directors' group ranked this

statement in twelfth (out of 16) ranking grouping, while undergraduate string teachers ranked it 25th (out of 29). Teachout findings indicated that preservice teachers ranked this item 30th, while experienced teachers ranked it 24th.

Teaching Skills and Behaviors

Thirteen teaching skills and behaviors statements were in the survey used in this study. The first statement of teaching skills and behaviors, "Be knowledgeable of subject matter," received a small ranking disparity among all participant groups. Both master teachers and graduate string teachers ranked this statement in the first ranking grouping (out of 10 ranking groupings for master teachers and out of 8 ranking groupings for graduate string teachers), while directors', and undergraduate string teachers' rankings for this statement was third (out of 16) and second (out of 29). It seems that having a good grasp of the knowledge of subject matter materials is agreed upon among experienced and preservice teachers in the current study as all four groups ranked this statement in the top ten highest ranked skills and behaviors for successful teaching. Teachout reported preservice teachers ranked this statement 7th, while experienced teachers ranked it 12th.

The teaching skills and behaviors statement, "Maintain an effective pace," was ranked within one ranking order between master teachers and graduate string teachers, while the overall ranking disparity between all four groups of participants was greater. This statement ranked in the fifth (out of 16) grouping in the directors' ranking list, 8th (out of 29) in the undergraduate string teachers, while master teachers and graduate string teachers ranked it in the first (out of 10) and second (out of 8) ranking groupings

respectively. In Teachout's study, preservice teachers ranked this statement 25th, while experienced teachers ranked this item 20th.

The statement "Be able to work with students of different ages and abilities" was ranked in the second grouping by master teachers and graduate teachers (out of 10 ranking groupings for master teachers and out of 8 ranking groupings for graduate string teachers), directors ranked this statement in the seventh (out of 16) ranking grouping, and 14th (out of 29) by undergraduate string teachers. Master teachers and graduate string teachers in this study seem to value a teacher's ability to work with students of different ages and performance abilities more than undergraduate string teachers and directors. Both directors and undergraduate string teachers ranked this item towards the middle of their ranking lists. In Teachout's study, all participants ranked this item within one ranking order. Preservice teaches ranked this item 25th, while experienced teachers ranked this item 24th, also in the middle of the list.

When examining the teaching statement, "Be able to present a lesson with clarity," master teachers ranked this statement in the second (out of 10) ranking grouping, third (out of 8) ranking grouping by graduate string teachers, in the seventh (out of 16) grouping by directors, and undergraduate string teachers ranking was 14th (out of 29). Teachout reported preservice teachers ranked this item 9th, while experienced teachers ranked it 17th. In the current study, master teachers and graduate string teachers value clarity of delivery more than directors and undergraduate string teachers.

When examining the statement "Maintain student behavior (strong, but fair discipline)," we observe that both master teachers and graduate string teachers ranked this statement in the third ranking grouping (out of 10 ranking groupings for master

teachers and out of 8 ranking groupings for graduate string teachers), while directors and undergraduate string teachers' rankings were in the seventh (out of 16) and fifteenth (out of 29) grouping respectively. In Teachout's study, the participants ranked this item within 13 ranking orders: preservice teachers ranked this statement 14th, while experienced teachers ranked it 1st.

Additionally, the statement, "Frequently makes eye contact with the students," was ranked in the third grouping by both master teachers and graduate string teachers (out of 10 ranking groupings for master teachers and out of 8 ranking groupings for graduate string teachers), in the eighth grouping (out of 16) by directors, and undergraduate string teachers ranked it 16th (out of 29). In Teachout's study, preservice teachers ranked this item 17th and experienced teachers ranked it 21st.

When examining the statement, "Involve students in the learning process," master teachers and graduate string teachers ranked this statement one ranking order apart. Directors ranked this statement in the ninth ranking grouping (out of 16), undergraduate string teachers ranked 18th (out of 29), while master teachers and graduate string teachers ranked this statement in the third (out of 10) and fourth (out of 8) ranking groupings respectively. It is interesting to see the directors' opinions regarding involving students in the learning process ranked 9th when teacher education programs strive to shift the curriculums towards student-centered rather than teacher-centered learning. However, the ranking of this statement might be affected by the relatively small cell size of directors group compared to the undergraduate string teachers. This is consistent with Teachout's findings. In Teachout's study, preservice teachers ranked this item 4th, while experienced teachers ranked this item 9th. Although 22 years have lapsed between the current study

and Teachout's study, It seems that preservice teachers in both studies, value more the student-centered learning than professionals including faculty members, graduate students, and experienced music teachers.

When examining the teaching skills and behaviors statement, "Employ a variety of materials/activities within a lesson," we can observe that this statement was ranked higher by more experienced teachers than undergraduate string teachers. Directors ranked this statement in the ninth ranking grouping (out of 16), while master teachers and graduate string teachers both ranked it in the fourth grouping (out of 10 ranking groupings for master teachers and out of 8 for graduate string teachers), and undergraduate string teachers' rankings for this statement was 20th (out of 29). The participants in Teachout's study ranked this item within three ranking orders apart. Preservice teachers ranked this item 27th, while experienced teachers ranked this item 30th. Less experienced teachers in both studies ranked this item lower than did more experienced teachers.

The statement, "Possess an understanding of teaching/learning strategies," was ranked in the 10th ranking grouping (out of 16) by directors, in the 21st ranking grouping (out of 29) by undergraduate string teachers, while both master and graduate string teachers ranked it in the 4th ranking grouping (out of 10 ranking groupings for master teachers and out of 8 for graduate string teachers). Teachout reported that preservice teachers ranked this item 22nd, while experienced teachers ranked this item 28th. In both Teachout's and the current study, more experienced teachers seem to value possessing an understanding of the teaching and learning strategies more than less experienced teachers.

"Possess good planning skills" was ranked in the 10th grouping (out of 16) by directors, in the 21st (out of 29) by undergraduate string teachers, and in the 5th (out of 10) and the 4th ranking group (out of 8) for master teachers and graduate string teachers. In Teachout's study, preservice teachers ranked this statement 22nd, while experienced teachers ranked it 27th. In her yearlong exploratory qualitative study examining the lived experiences of preservice teachers working in a university String Project, Schmidt (2005) indicated that despite her effort to encourage preservice teachers to keep a written lesson plans, some preservice teachers did not seem to develop written lesson planning skills. Additionally, Schmidt found that some preservice teachers understood planning as the ability to find music for their students and that written lesson plans were not necessary for teaching at the String Project.

When examining the statement, "Move around the classroom," we observe that master teachers and graduate string teachers both ranked this statement in the 5th ranking grouping (out of 10 ranking groupings for master teachers and out of 8 for graduate string teachers), in the 11th grouping (out of 16) for the directors' group, and 23rd (out of 29 ranking groupings) in the undergraduate string teachers' ranking list. Teachout's statement "Move among the group," the equivalent of the current statement "Move around the classroom," was ranked within one ranking order among the two participant groups. Preservice teachers ranked this item 34th, while experienced teachers ranked it 33rd.

The teaching skills and behaviors, "Handle routine repairs (change broken strings, adjust the bridge…etc.)," received different rankings among the four groups of participants. The smallest ranking disparity was found between master teachers and

graduate string teachers. Master teachers ranked this statement in the eighth ranking grouping (out of 10), while graduate string teachers ranked it in the sixth ranking grouping (out of 8). Directors ranked this statement 13th (out of 16), and undergraduate string teachers ranking was in the 26th ranking grouping (out of 29). Because String Project string teachers don't handle finances, I eliminated Teachout's statement "Be able to manage finances well" and replaced it with the current statement "Handle routine repairs (change broken strings, adjust the bridge… etc." therefore, these two statements cannot be compared with each other.

Musical Skills and Behaviors

The survey adapted in this study contained nine statements pertaining to musical skills and behaviors. Most of these statements are at or near the bottom of every ranking list for all participant groups. The first of the musical skills and behaviors, "Possess aural skills," appeared in the top-ranking grouping in master teachers' (out of 10) and graduate string teachers' (out of 8) lists, in the fourth ranking grouping (out of 16) in the directors group list, and 4th (out of 29 ranking groupings) on undergraduate string teachers ranking list. All groups ranked the top skills and behaviors on all groups' ranking lists. This indicates that all participants believe that aural skills are among the top skills and behaviors needed for teaching strings. In Teachout's study, the statement "Possess excellent ear-training skills," the equivalent of the current statement "Possess aural skills," was ranked 32nd by preservice teachers, and 28th by experienced teachers. A possible explanation for this ranking disparity between the current study and Teachout's is the wording of the statement. Teachout used the word "excellent" in the beginning of the statement denoting that teachers must have extremely good ear-training in order to be

a successful teacher. While skillful performers do possess very good ear-training/aural skills, adequate but effective aural skills may suffice for teaching music. Another possible explanation is that participants in this study are from universities that emphasize the importance of teachers' aural skills in its music education programs. However, this might not be true for participants with other majors or music majors.

Directors and undergraduate string teachers ranked the statement "Maintain high musical expectations" in the fourth (out of 16) and fifth ranking groupings (out of 29), while both master teachers and graduate string teachers ranked this statement in the top-ranking grouping (out of 10 ranking groupings for master teachers and out of 8 ranking groupings for graduate string teachers). Although most of the musical skills and behaviors reside on the bottom of every ranking list, maintaining high musical expectations was among the top musical skills and behaviors for all participants. Teachout reported that both preservice and experienced teachers ranked this item within four ranking orders. Preservice teachers ranked this item 13th, while experienced teachers ranked it 9th, also near the top of his 40-item survey.

When examining the statement, "Display a high level of musicianship," we observe that the more experienced teachers found displaying high musicianship among the most important skills and behaviors a String Project teacher need. Master teachers' and graduate string teachers' rankings were in the first grouping (out of 10) and in the second ranking grouping (out of 8) respectively, while directors ranked this statement in the fifth grouping (out of 16), and undergraduate string teachers ranked it ninth (out of 29 ranking groupings). String Project teachers ranked this item among the top highest ranked skills and behaviors. In Teachout's study, participants ranked this item ten ranking orders

apart. Preservice teachers ranked this item 11th, while experienced teachers ranked it 22nd, lower than the current study.

Both master teachers and graduate string teachers ranked the musical skills and behaviors statement, "Incorporate singing when teaching," in the fourth ranking grouping (out of 10 ranking groupings for master teachers and out of 8 for graduate string teachers), while directors and undergraduate string teachers ranked it in the tenth (out of 16) and twenty-first (out of 29) ranking groupings respectively. In Teachout's study, the statement, "Possess excellent singing skills," the equivalent of "Incorporate singing when teaching" in the current study, was ranked 40th or last by both preservice and experienced teachers. While possessing excellent singing skills might be good for choir teachers, string teachers only need to have adequate singing voice to be able to model. However, not all string teachers use singing as a means to model for their students. In my study, directors, master teachers, and graduate string teachers all ranked this statement in the top ten skills and behaviors for string teaching, while undergraduate string teachers believe it is somewhat important, but not among the most important skills and behaviors for teaching strings. This might also have to do with curricular emphasis between music education programs in both Teachout's and the current study.

When examining the musical statement, "Possess musical knowledge (theory, history, etc.)," master teachers and graduate string teachers ranked this statement in the sixth (out of 10) and fifth (out of 8) ranking groupings respectively, while directors and undergraduate string teachers ranked it in the 11th grouping (out of 16) and 24th (out of 29 ranking groupings) for undergraduate string teachers. Teachout reported that preservice teachers ranked this statement 37th, while experienced teachers ranked it 32nd.

Unlike most of the other professions, music teachers acquire knowledge and understandings regarding musical concepts long before they become teacher. This may explain why String Project teachers believe that possessing musical knowledge is not as important as other skills and behaviors that belong in the personal and teaching skills and behaviors categories.

When examining the statement, "Be knowledgeable and proficient with secondary instruments," directors ranked this statement in the twelfth ranking grouping (out of 16), graduate string teachers' ranking was in the fifth grouping (out of 8), master teachers in the seventh grouping (out of 10), and undergraduate string teachers' ranking was 26th (out of 29). In Teachout's study, preservice teachers ranked this statement 32nd, while experienced teachers ranked it 37th. In order to be able to teach orchestral string instruments, string teachers need to have a good grasp of the mechanism of each string instrument, as well as possessing the knowledge, understanding, and teaching strategies necessary to teach a group of students with different instruments. However, one can argue that being proficient in all string instruments is a challenging task. During music teacher-education programs, music education majors enroll in technique classes including string techniques. During these classes, music education majors gain invaluable insight into the working of string instruments and teaching strategies to assist beginner teachers in detecting performance/posture issues and fix them. Also, private lesson teachers working at a String Project may rely on previous knowledge and experiences as students when teaching string instruments. This may explain why the statement "Be knowledgeable and proficient with secondary instruments" was ranked low on every participant group list. Perhaps teachers have very different ideas of what it means to be

"proficient" on all string instruments. For example, some teachers possess good working knowledge of orchestral string instruments, but most won't consider themselves "proficient" in all instruments.

The musical skills and behaviors statement, "Possess excellent sight-reading skills," was ranked 14th (out of 16) on the directors list, in the 8th ranking grouping (out of 10) on master teachers, in the 6th ranking grouping (out of 8) on graduate string teachers' list, and 27th (out of 29) on undergraduate string teachers' ranking list. While sight-reading might play an essential role in music performance, music teachers may not really rely on sight-reading. One of the things that music teachers learn through teacher-education programs is lesson-planning skills. Teachers usually have the opportunity to look at the music beforehand to plan their lessons. This can allow the teacher to determine which part/section of the music needs more attention and formulate exercises/drills to remedy these problem parts. This may explain why the statement "Possess excellent sight-reading skills" was ranked low on undergraduate string teachers. In Teachout's study, preservice teachers ranked this statement 36th, while experienced teachers ranked it 35th, also near the bottom.

"Possess competent conducting gestures" was ranked low on every participant groups' ranking list. This statement was ranked within 21 ranking orders or less among all participant groups. It ranked 15th (out of 16) on directors' list, 9th (out of 10) on master teachers, 7th (out of 8) on graduate string teachers, and 28th (out of 29) on undergraduate teachers. Teachout similarly reported preservice teachers ranked this statement 34th and experienced teachers ranked it 38th. One possible explanation of the low rankings for conducting skills and behaviors is that String Project teachers rely more on demonstrating

with their instruments, voices, and in some cases, their body language to convey certain performance aspects, therefore, conducting is not used extensively during classes, nor during private lessons.

The musical skills and behaviors, "Possess proficient piano skills," sits at the very bottom of every ranking list. This statement ranked 16th (out of 16) on directors' list, 10th (out of 10) on master teachers, 8th (out of 8) on graduate string teachers' list, and 29th (out of 29) on undergraduate string teachers' list. This is consistent with Teachout's findings. In Teachout's study, all participants ranked this statement 39th (out of 40).

Discussion of Statistical Procedures

Although the inferential statistics of the current study suggested no statistical differences in perspectives of the important skills and behaviors among String Project directors and teachers, we can still observe differences among the four groups of participants. From the results of the descriptive statistics, it seems that generally, participants of all ages and music teaching experience believe that the skills and behaviors designated in this study as personal skills and behaviors are of utmost importance in their string teaching. Previous studies investigating teachers' skills and behaviors found similar results (Davis, 2006; Edelman, 2016; Miksza, 2010; Moss, 2007; Teachout, 1997). This could be attributed to several factors, including statistical and epistemological understanding of what constitutes "important" skills and behaviors to string teachers with various levels of music teaching experience.

Statistical Factors

I found two preliminary statistical differences across all studies that examined participants' perception of important skills and behaviors based on Teachout's 40-item

survey discussed in chapter two and in the current chapter. The first key difference between these studies is the statistical procedures used to analyze the data. Some studies used the repeated-measures ANOVA procedure to determine which of the three categories of skills the participants deemed most important (Edelman, 2016; Davis, 2006; Teachout, 1997). Moss (2007) used Chi-Square test for independent samples to determine whether or not there were statistically significant differences between two participant groups on the ranking of the three broad categories of skills and behaviors.

Teachout calculated mean scores for each group on each survey item. From the participants' mean scores, he calculated the ranking of each survey item for each group. Then, he used the mean scores to conduct a two-way repeated-measures ANOVA with two independent variables: teaching experience with two levels (experienced and preservice), and three broad categories of skills and behaviors (personal, teaching, and musical skills and behaviors), using the participants' scores as repeated measures. Davis (2006) also utilized a two-way repeated-measures ANOVA to determine if there were statistically significant differences in importance ranking between undergraduate music education majors in their first year of music education course and music student teachers' mean scores. Additionally, Edelman (2016) conducted a one-way repeated-measures ANOVA to determine whether or not there were significant differences between the three broad categories of skills and behaviors. To further investigate participants' perceptions regarding which of the three broad categories of skills and behaviors is deemed most important by the participants, Moss first calculated the participants' mean scores for each survey item then conducted a Chi-Square test for independence.

Generally, repeated-measures ANOVA is used to determine if there are mean differences between dependent samples over time. Repeated-measures ANOVA takes into consideration the correlation between the repeated measures, and therefore, violates the assumption of independence of the observations in a standard ANOVA procedure (Russell, 2018). A one-way repeated-measures ANOVA is used to test the impact of one independent variable on a single dependent variable after different treatment or under different conditions.

A two-way ANOVA tests the impact of two independent variables on a single dependent variable. This is why the family of ANOVA statistical procedures are called univariate tests. In repeated-measures ANOVA and repeated measures MANOVA, the sample is measured several times on different occasions; however, in multivariate analysis of variance (MANOVA), each dependent variable represents a different measurement or characteristic. Therefore, the use of different inferential statistical procedures could impact the findings of the study. The MANOVA procedure allows the researchers to examine an independent variable and multiple dependent variables simultaneously using one statistical test. Although other studies used one-way repeated-measures ANOVA, in the current study, I chose to use a one-way MANOVA to determine whether or not there were significant differences between the four participant groups, using the three broad categories as three dependent variables.

The second statistical difference found between the studies that examined teachers' skills and behaviors is the format of the survey questions. The majority of the studies adapting Teachout's survey utilized rating scales to determine the importance rating of each item (Davis, 2006, Edelman, 2016; Moss, 2007; MacLeod & Walter,

2011), and only one study asked the participants to rank the items instead of rating them (Miksza et al., 2010). Some studies used a four-point Likert-type scale to rate the importance of each item (Davis, 2006; Edelman, 2016; Moss, 2007; Teachout, 1997). On the other hand, MacLeod and Walter (2011), like the current study, used a rating scale with a middle point to allow the students to choose a neutral position. The decisions researchers make regarding how to formulate survey questions could affect the results of the analysis later.

Epistemological Understandings of Important Attributes

Findings of previous studies that examined teachers' skills and behaviors suggested that music teachers of various music-teaching experience believe that personal skills and behaviors are more important than teaching and musical skills and behaviors (Davis, 2006; Edelman, 2016; Teachout, 1997). MacLeod and Walter (2011) found that personal, teaching, and musical skills and behaviors had similar means and standard deviations. This may be due in part to the fact that teacher education programs generally focus on musical and teaching aspects and not as much light is shed on the personal aspect of music teachers, although findings of several studies suggested a direct relationship between teacher's personality and successful teaching (Hamann, Lineburgh, & Paul,1998; Juchniewicz, 2010). Also, from the ranking lists of each participant group, it is noticeable that participants with less music teaching experience have similar beliefs regarding the importance of certain skills and behaviors items. This may be caused by the similarities in instruction that music teachers receive during their teacher education programs, or by beliefs they established prior to beginning their college education.

Teacher's personality has been examined in previous studies to predict success in instrumental music teaching. Hamann et al. (1998) found that emotional expressivity, emotional sensitivity, and social control have significant influence on teachers' score on the *Survey of Teaching Effectiveness* (STE). Juchniewicz (2010) found that among several distinguishing factors between exemplary and challenged teachers, music education experts listed social skills and behaviors eight times more than other non-social attributes. Stuber (1997) investigated the influence of teachers' personality type, learning style, and teaching experience on verbal and non-verbal behaviors, and selected music behaviors of experienced and less experienced band directors, and found through descriptive methods that teachers' learning styles and personality have a significant influence on teaching strategies of instrumental music teacher. Moss (2007) indicated that the majority of the participants reported acquiring most of the personal skills and behaviors through personal development and/or through influence from family and friends. This further indicates that music teachers acquire personal skills and behaviors outside of the teacher-education programs and that music teachers bring images of good teachers from previous experiences (Dolloff, 1999).

Schmidt (2005) indicated that preservice teachers reported difficulty in understanding the educational needs of their students and reported difficulty in planning for their lessons (Schmidt, 2005). This may explain why participants of previous studies and the current study ranked teaching skills and behaviors second. Inspired by their teachers and colleagues, beginning music teachers start learning and acquiring new teaching and musical skills long before they enroll in teacher-education programs (Dolloff, 1999).

Previous studies compared the perception of beginning music education majors (Davis, 2006), preservice and experienced music teachers (Teachout, 1997), and mentor teachers' opinions of the most important skills and behaviors necessary for music teaching (Edelman, 2016; MacLeod & Walter, 2011; Miksza et al., 2010). I found no existing study that focused on music teachers with music performance background or teachers with academic majors outside of the field of music. In the current study and previous studies, the participants come from various teaching and learning backgrounds. Some of the participants in the current study, both experienced and beginner teachers indicated having backgrounds in performance or other academic majors outside of music, while other participants hold degrees in both music education and performance.

Limitations of the Study

One of the limitations of the current study I encountered with the raw data was related to the construction of the survey. To cut short the time needed to complete the survey, I constructed the question that asked the participants to indicate their age as a drop-down list. This allowed the participants to choose their age from a drop-down list, with four-year interval increments. While this allowed for shorter time to complete the survey, it also presented a problem during the analysis process. Setting up the question in this fashion prevented gathering data at the ratio level regarding participants' age. Asking the participants to provide their age in a short answer question would have allowed me to examine the perspectives of undergraduate string teachers at each year of their degrees.

Another limitation was the small sample size. Due to time constraints, I sent out the cover letter containing a link to the electronic survey towards the end of the Spring semester of 2018, a time of the year when most of the String Projects across the country

are wrapping up the semester and are busy with String Project concerts and recitals. It is also the time when graduate and undergraduate students are most busy working on final papers and their own recitals. This may have limited the number of completed and returned surveys. However, prior to conducting a one-way MANOVA, I tested the assumptions needed to conduct a one-way MANOVA and found that the assumptions of normality and homogeneity have been met given the relatively small sample size, therefore, I proceeded with the parametric test. Additionally, the limited number of String Projects across the United States adversely affected the number of submitted surveys. According to the National String Project Consortium website, there are 40 String Projects across the United States. I made every effort to reach out to all String Project directors and/or master teachers however, only 19 out of the 40 String Projects participated in this study. This further limited the number of completed surveys.

Furthermore, the large disparity in participants in each group presented another limitation to the study. Experienced teachers including directors (n = 16), master teachers (n = 7), and graduate String Project teachers (n = 6) is a small group compared to the number of undergraduate string teachers (n = 46). Participant groups with relatively smaller cell sizes (master teachers and graduate string teachers) had more tied rankings than did participant groups with larger cell size (undergraduate string teachers). The tied rankings resulted in different ranking orders for each participant group and prevented acquiring an accurate ranking for each of the 40 items. Also, the small cell sizes resulted in difficulty answering the research question that asked, “Are there any differences in perspectives by age, gender, or academic major?” The large difference in participant numbers between the four groups may have affected the results of the MANOVA test.

Another limitation to the current study was the lack of variability in the mean scores. This lack of variability created a ceiling effect, as most of the skills and behaviors were ranked "important" or higher and only a few skills and behaviors statements were ranked "less important." I examined the means and standard deviations up to 6 decimal points and found that the items that have tied rankings have identical means and standard deviations. Teachout generated his 40-item survey based on the top 20 mentioned skills and behaviors from a questionnaire that he administered to experienced music teachers, and the top 20 skills and behaviors from preservice teachers, indicating that these teachers considered all 40 survey items important for teaching. This may explain why some previous work as well as the current study found skewness in the ranking mean scores, caused by lack of variability. This lack of variability was also reported by other studies based on Teachout's survey (Davis, 2006; Edelman, 2016; Miksza et al., 2010).

Teachout indicated that two skills and behaviors (motivation and confidence) that both preservice and experienced teachers believed to be extremely important are rarely discussed in teacher-education programs, while musical skills and behaviors such as piano and singing skills are commonly discussed in music education programs. Miksza et al. suggested that it is possible to assume that music teachers value a wide range of skills and behaviors, which also may explain the skewness in ranking mean scores.

Recommendations for practice

This study provided an overview of what String Project teachers deem as important skills and behaviors for successful string teaching. The results of this study can be used to inform the teaching practices of music teacher-education programs. It seems that String Project teachers of various music teaching experience and academic majors,

just like teachers from other music specialties, believe that personal skills and behaviors are of utmost importance followed by teaching skills and musical skills and behaviors. Teacher education programs may focus more on the musical and teaching aspects; perhaps the personal aspects of music teachers are seldom discussed in music education courses. Therefore, music teacher education programs may focus more on the social aspect of music teachers' development.

Suggestions for Continued Research

Researchers interested in examining the perception of String Project teachers and directors regarding the skills and behaviors important for successful teaching could focus on three elements: utilizing or constructing a sensitive instrument, the format of the survey questions, and examining the epistemological aspect of what constitutes important skills and behaviors for instrumental music teachers with different music teaching experience.

Survey design plays a prominent role in the outcomes of a study. A researcher's choice of whether to use a rating scale with no middle point or with a middle point may yield slightly different results. Likewise, asking the participants to rank the order of the statements according to their importance in their teaching instead of rating them may yield different results and could prevent the occurrence of tied rankings.

Additionally, researchers interested in duplicating the current study could implement a different survey design to avoid the issues I encountered during the analysis procedures. Also, formulating survey questions that gather more detailed information could lead to more accurate results, especially when participants are college students. In the demographic section of the current study, I formatted the age variable in four-year

intervals, which prevented gathering more detailed data. Future studies implementing the same statistical procedures as in the current study may also consider non-parametric statistical procedures such as the Mann-Whitney U test to account for the small sample size and large participant disparity in each group.

Both the current study and existing studies based on Teachout's survey found, through inferential statistical procedures or descriptive statistics, that the skills and behaviors Teachout designated as personal skills and behaviors ranked higher than teaching and musical skills and behaviors. In an effort to test the validity of the modified survey statements, I asked a panel of music education experts to assign each of the 40-items to one of the three broad categories of skills and behaviors, and found they did not agree on the categories for 30 of the 40 items (see Appendices B and L). Edelman also conducted a face validity test and found that the panel of experts did not agree on the designation of 13 of the 40 items. Edelman also found that five of the 40 items were designated differently from Teachout's original survey. This indicates that individual teachers may have different understandings of some or all of the 40 statements. Researchers in the field of music education could investigate these discrepancies through qualitative research studies, by exploring the epistemological understanding of experienced and novice music teachers regarding what constitute important skills and behaviors.

Since the results of the current study found that the number of female String Project teachers and directors (66.7%) is larger than the number of male String Project teachers and directors (32%), future studies examining String Project teachers, or music educators in general, may investigate why the proportion of female teachers far exceed

that of male teachers. Hamann, Gillespie, and Bergonzi (2002) found that about two thirds of orchestra students were females and one third were males. Future studies interested in this field may explore possible ways to motivate more male string students to pursue degrees in string music education. If more male string teachers pursued degrees in string music education, will the shortage of string teachers be reduced?

Also, future studies could investigate the relationship between teacher's personality and teaching performance. Studies that examined the three broad categories of skills and behaviors found that music teachers believe that personal skills and behaviors are the most important category of skills and behaviors. However, the topic of teachers' personality may seldom be discussed in music education programs.

Furthermore, future studies could examine String Project teachers whose academic degrees are not in music education and compare their perspectives with those who have background in music education. The current study included String Project teachers and directors whose degrees were in music performance (25.3%), other music areas (8%), or fields outside of music (13.3%). These teachers and directors combined comprised approximately 46.6% of the participants.

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APPENDIX A

TEACHOUT STATEMENTS AND MODIFIED STATEMENTS

APPENDIX A

TEACHOUT STATEMENTS AND MODIFIED STATEMENTS

Skills and Behaviors	Designation	Modified to	Reason for modification
Enthusiastic, energetic	P		
Maximize time on task	P		
Involve students in the learning process	T		
Possess competent conducting gestures	M		
Maintain student behavior (strong, but fair discipline)	T		
Have a pleasant affect; sense of humor	P		
Be knowledgeable of subject matter	T		
Possess good lesson planning skills	T		

Maintain an effective rehearsal pace	T	Maintain an effective pace	Some String Project teachers teach only private lessons, not rehearsals.
Frequently make eye contact with students	T		
Move toward and among the group	T	Move around the classroom	Changed to make the statement clearer.
Be goal-oriented	P		
Maintain a high level of professionalism	P		
Employ a positive approach	P		
Possess excellent singing skills	M	Incorporates singing when teaching	Singing skills are not among the top priorities for string teachers. However, it would be interesting to see how string teacher utilize singing as a teaching tool.
Possess musical knowledge (theory, history, etc.)	M		
Use effective physiological communication (body language)	P		
Display confidence	P		
Maintain high musical standards	M	Maintain high musical expectations	
Possess excellent ear-training skills	M	Possess aural skills	Changed to shorten the statement

Be knowledgeable and proficient with secondary instruments	M		
Be patient	P		
Be organized	P		
Have excellent speaking skills (diction, tonal inflection, vocabulary)	P	Give clear instructions	Changed to shorten the statement
Easily develop a positive rapport with people	P	Develop positive rapport with the students	
Possess proficient piano skills	M		
Be creative, imaginative, and spontaneous	P	Employ creative teaching techniques	
Maintain excellent classroom management and procedures	T	Maintain effective time management	Some String Project teachers teach only private lessons. Another survey item asks about managing student behavior.
Be able to motivate students	P		
Display a high level of musicianship	M		
Possess excellent sight-reading (sight-singing) skills	M	Possess excellent sight-reading skills	Sight-reading and sight-singing skills are two separate sets of skills.
Possess strong leadership skills	P		
Be flexible and adaptable	P		

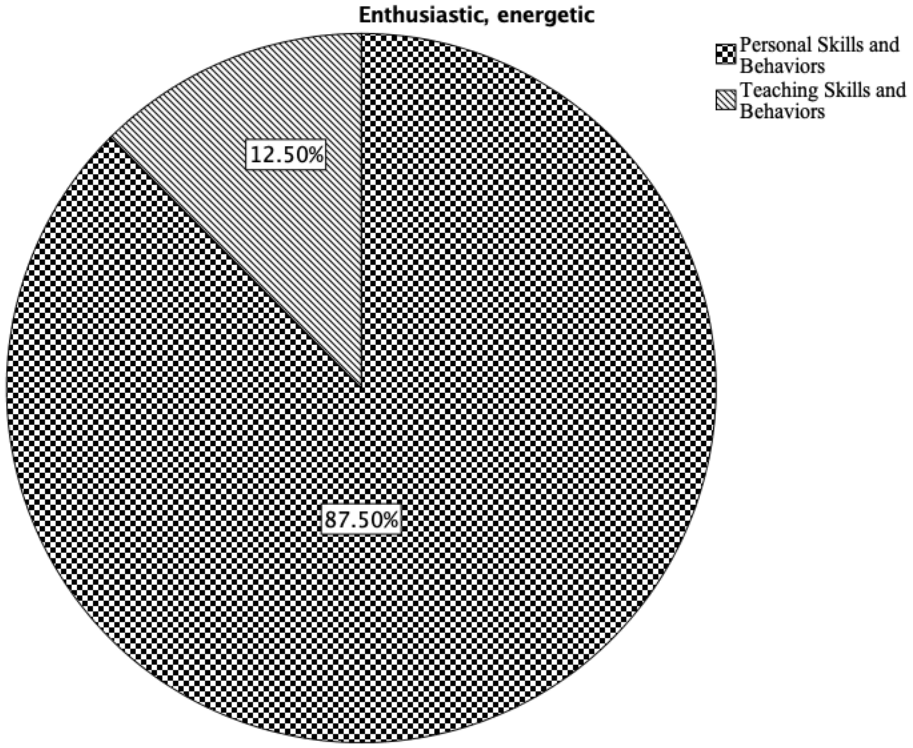
Be able to present a lesson with clarity	T		
Be able to manage finances well	T	Handle routine repairs ((change broken strings, adjust the bridge...etc.)	Most String Project teachers don't really handle finances, so this had to be changed to a skill more related to String Project teaching.
Possess an understanding of teaching/learning strategies	T		
Be able to work with students of different ages and abilities	T		
Employ a variety of materials/activities within a lesson	T		
Manage stress well	P		
Be mature and have self-control	P		

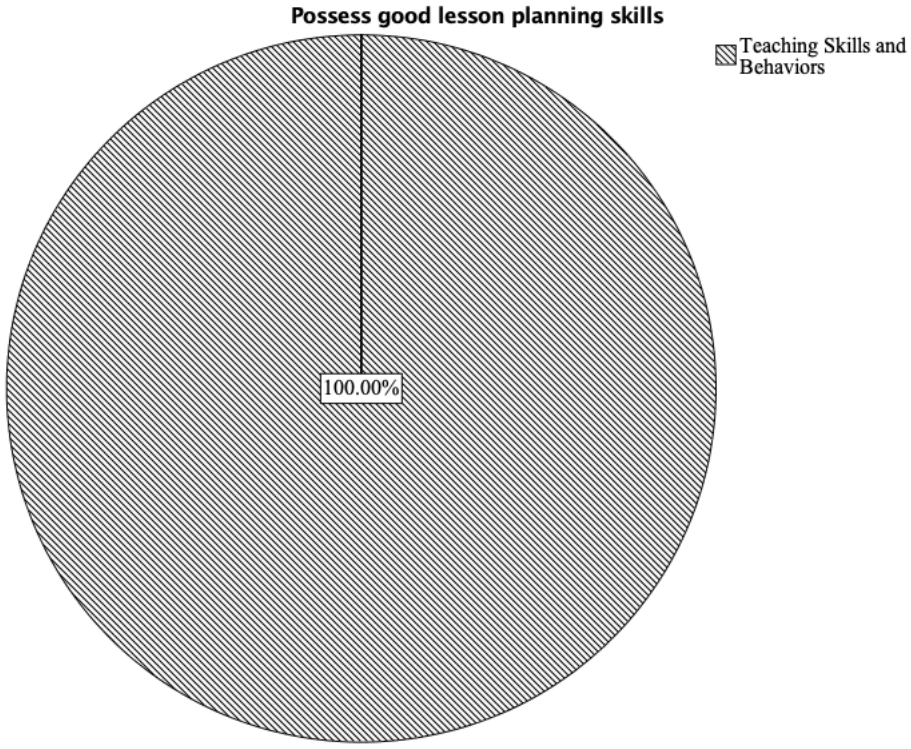
APPENDIX B

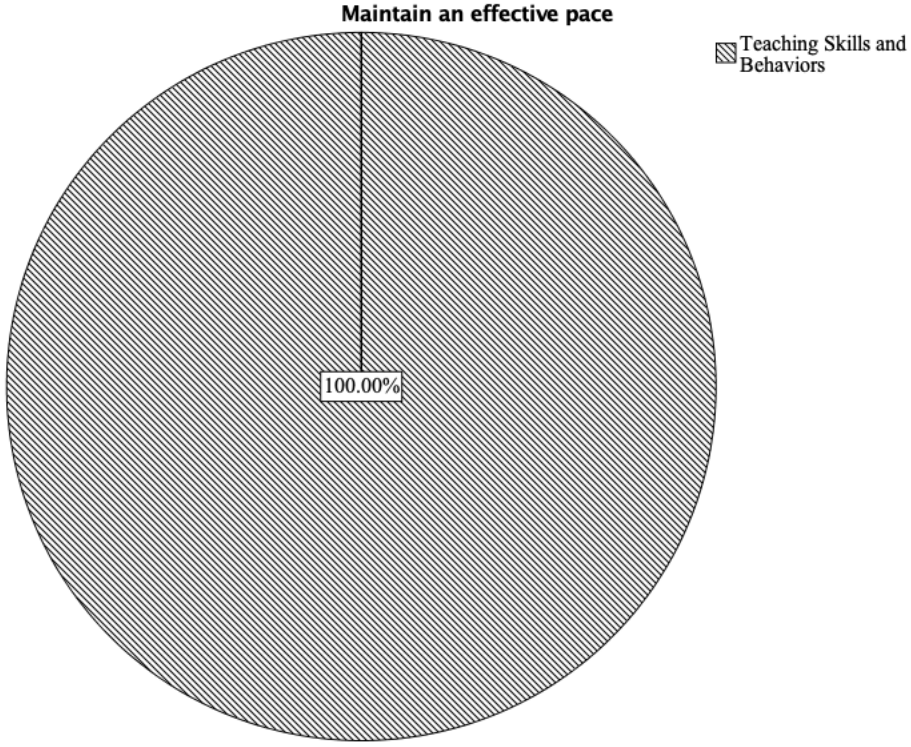
EXPERTS DESIGNATION OF THE 40 SKILLS AND BEHAVIORS

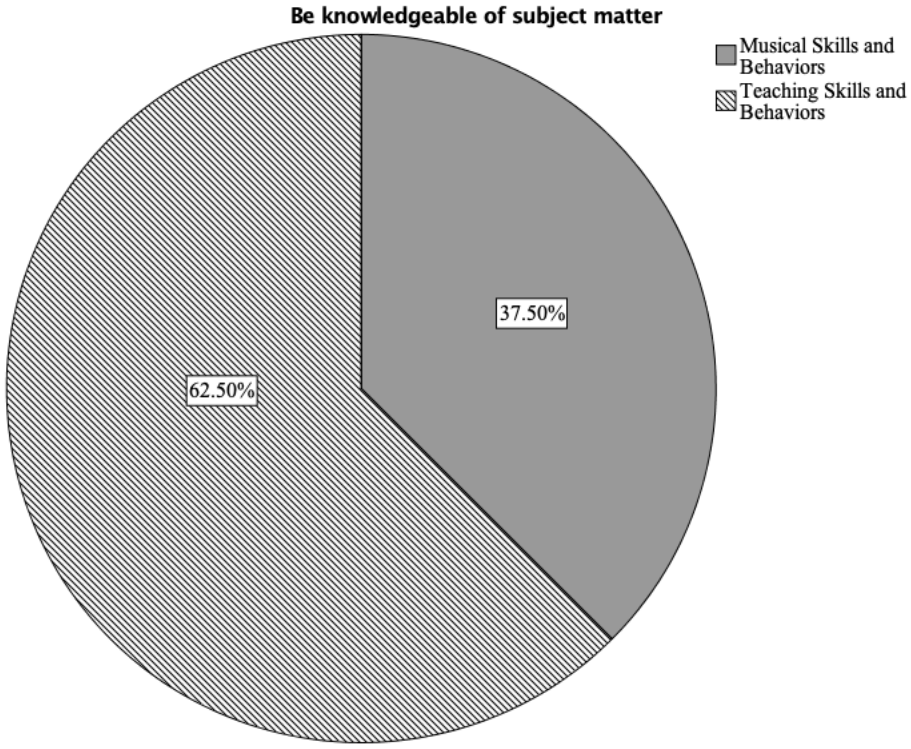
APPENDIX B

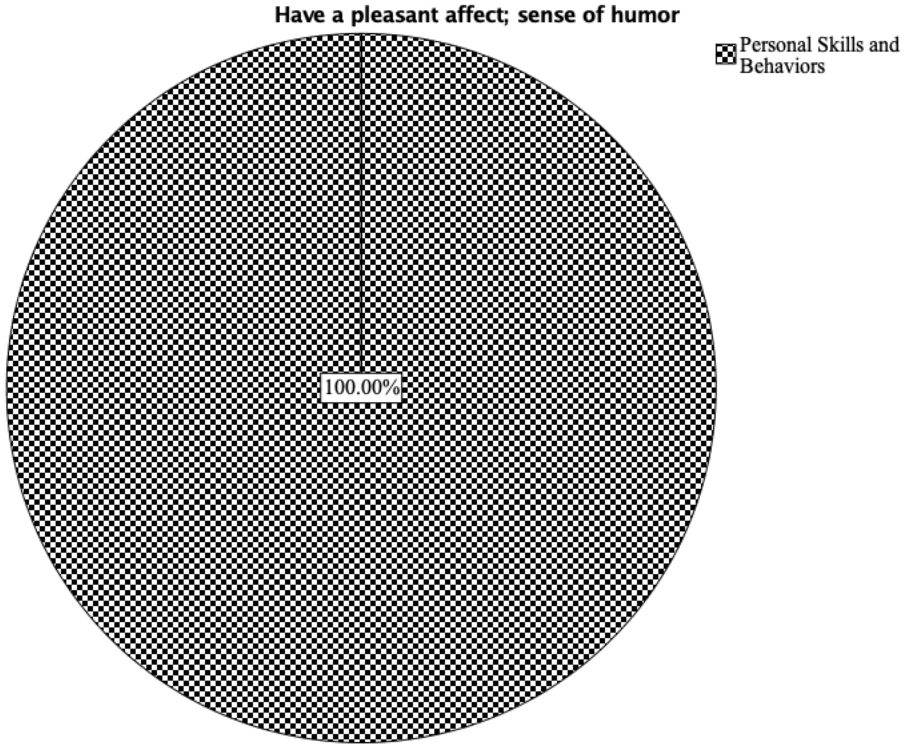
EXPERTS' CATEGORIZATIONS OF THE 40 SKILLS AND BEHAVIORS

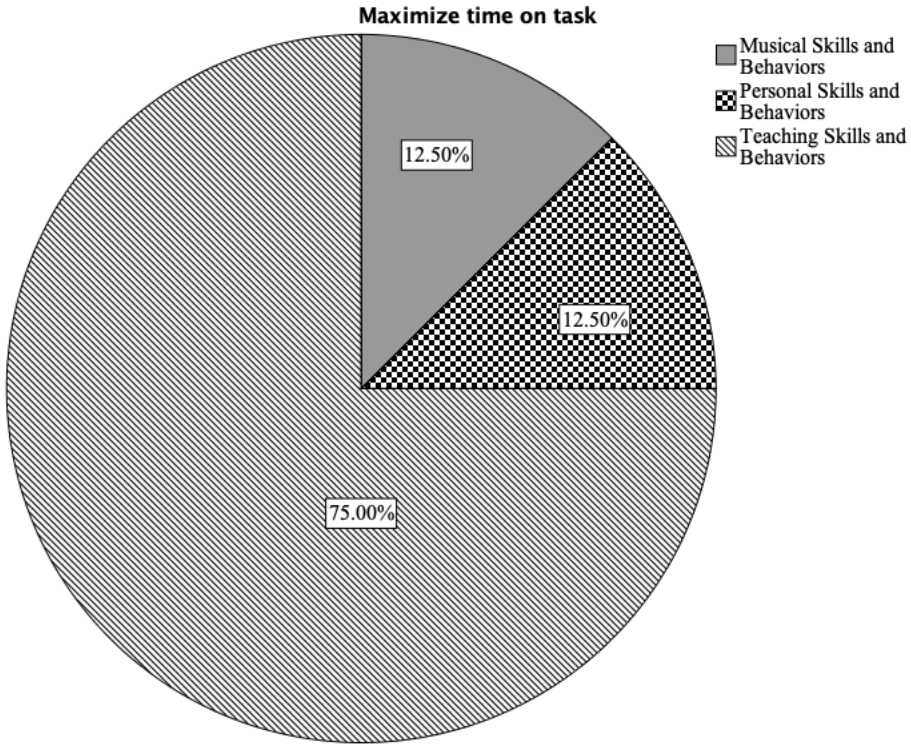


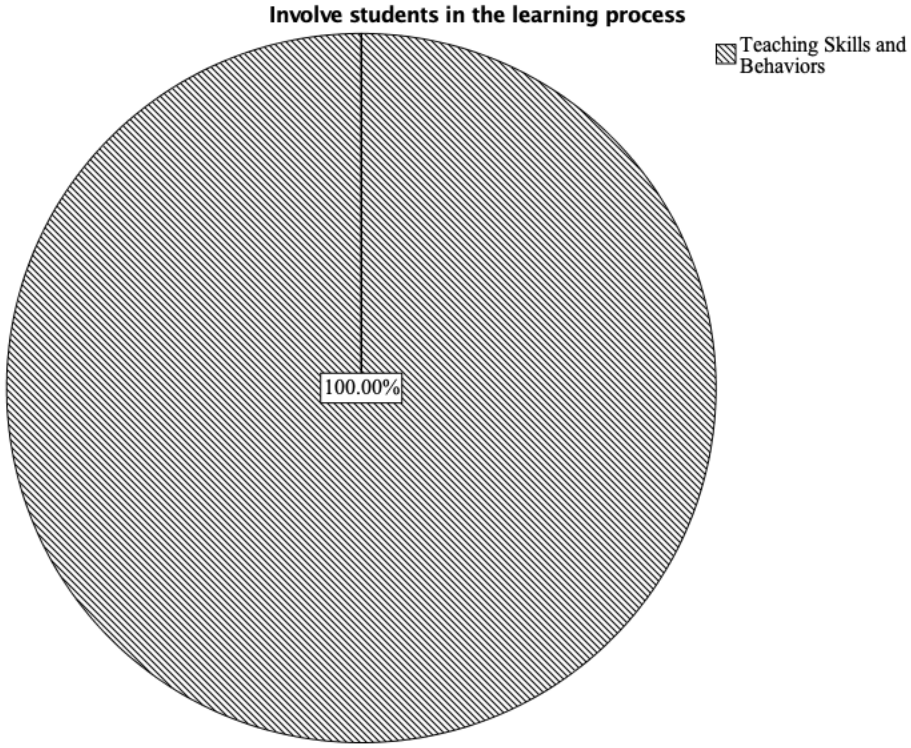

Possess good lesson planning skills
Teaching Skills and Behaviors
100.00%

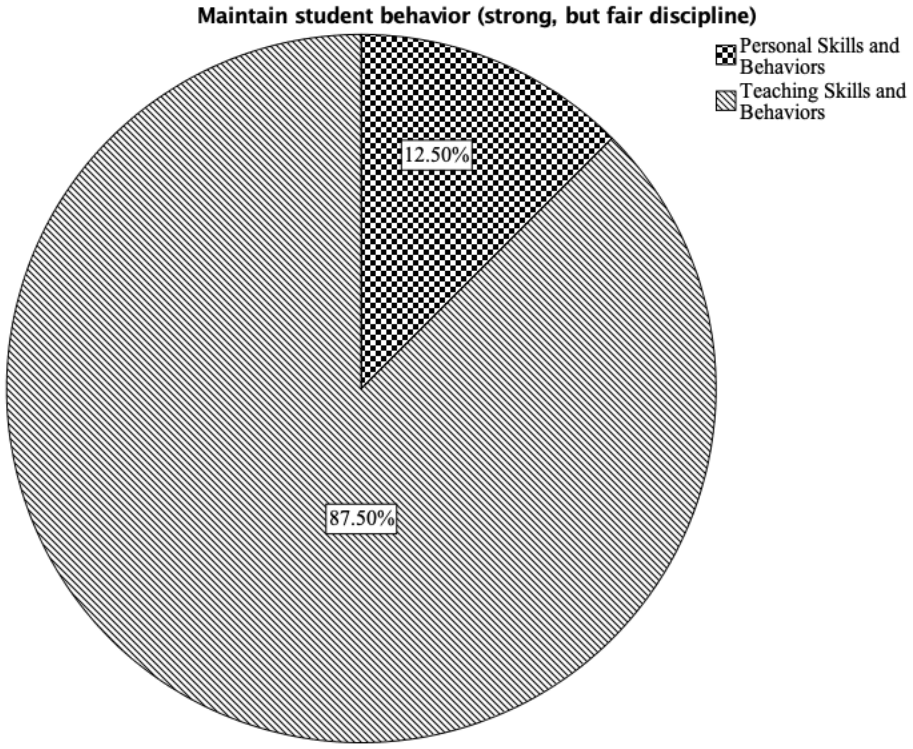

Maintain an effective pace
Teaching Skills and Behaviors
100.00%

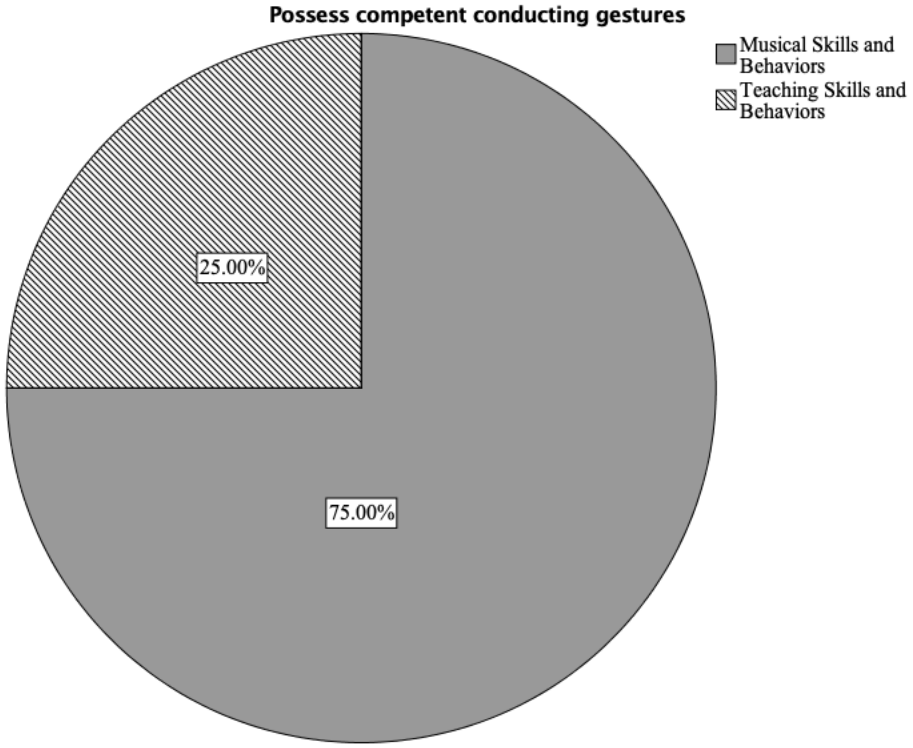

Be knowledgeable of subject matter
Musical Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

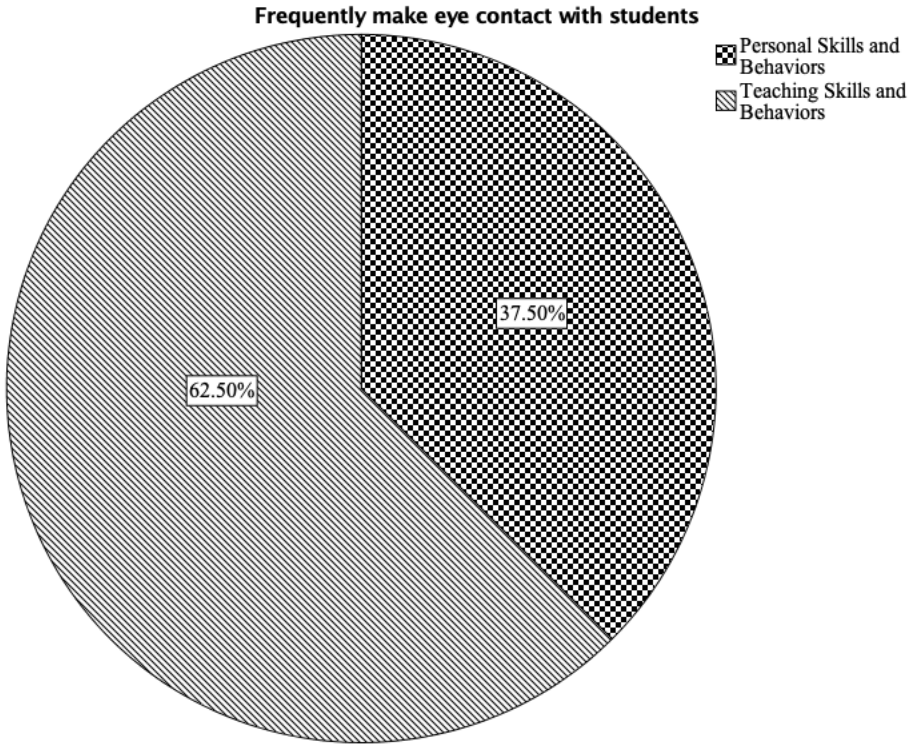

Have a pleasant affect; sense of humor
Personal Skills and Behaviors
100.00%

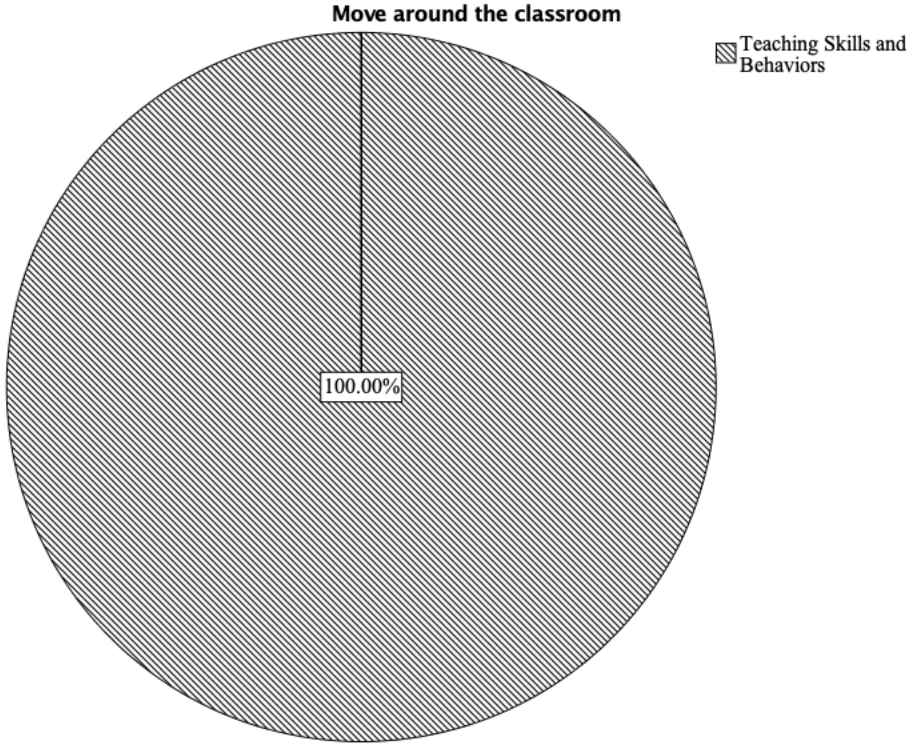

Maximize time on task
Musical Skills and Behaviors
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
12.50%
75.00%

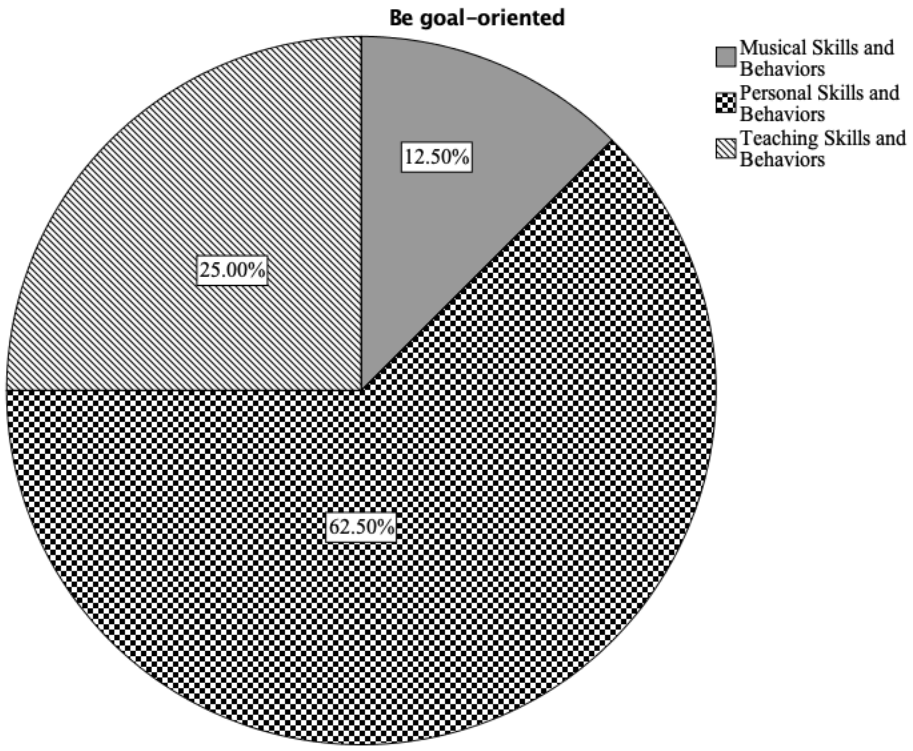

Involve students in the learning process
Teaching Skills and Behaviors
100.00%

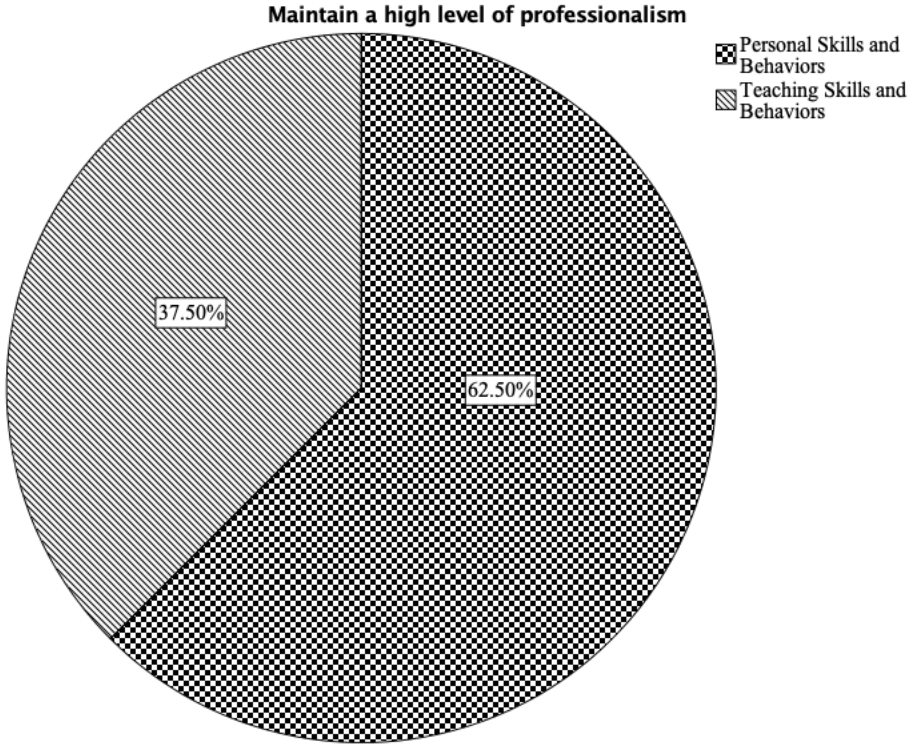

Maintain student behavior (strong, but fair discipline)
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%

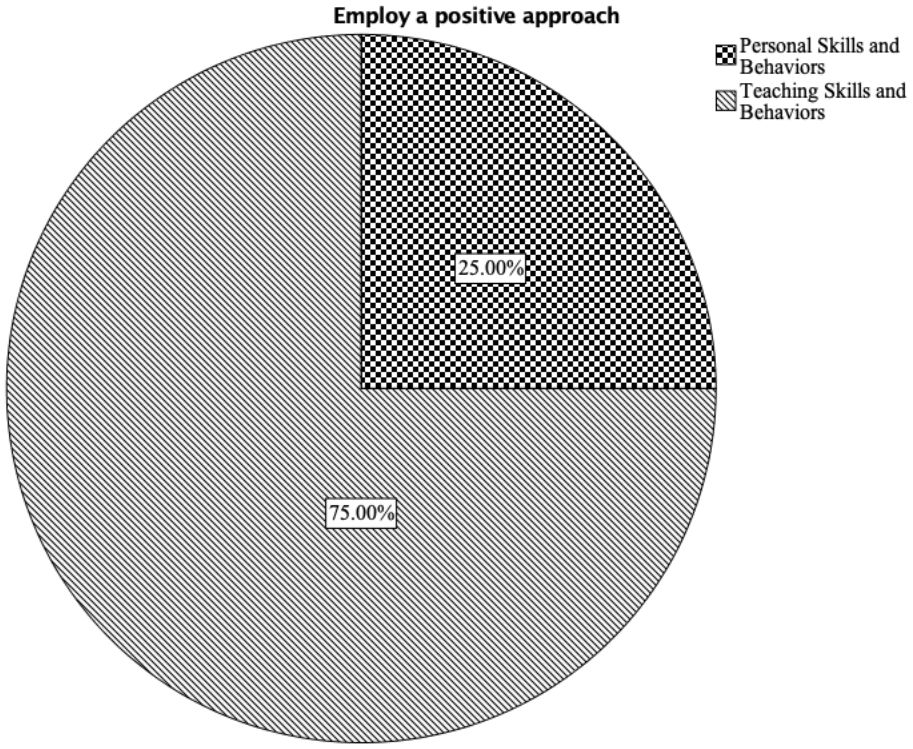

Possess competent conducting gestures
Musical Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

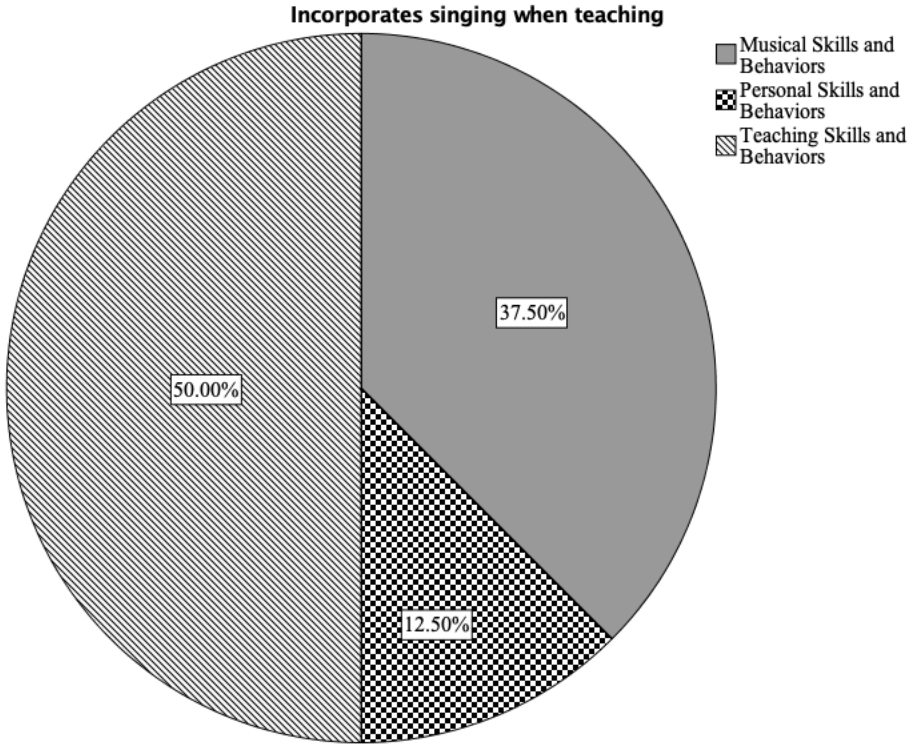

Frequently make eye contact with students
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

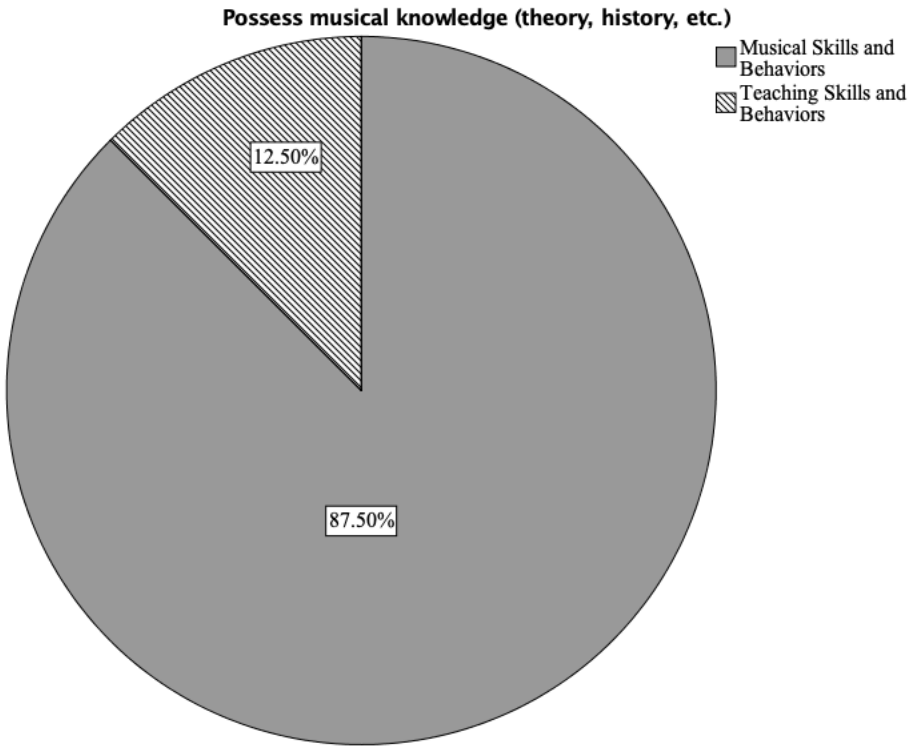

Move around the classroom
Teaching Skills and Behaviors
100.00%

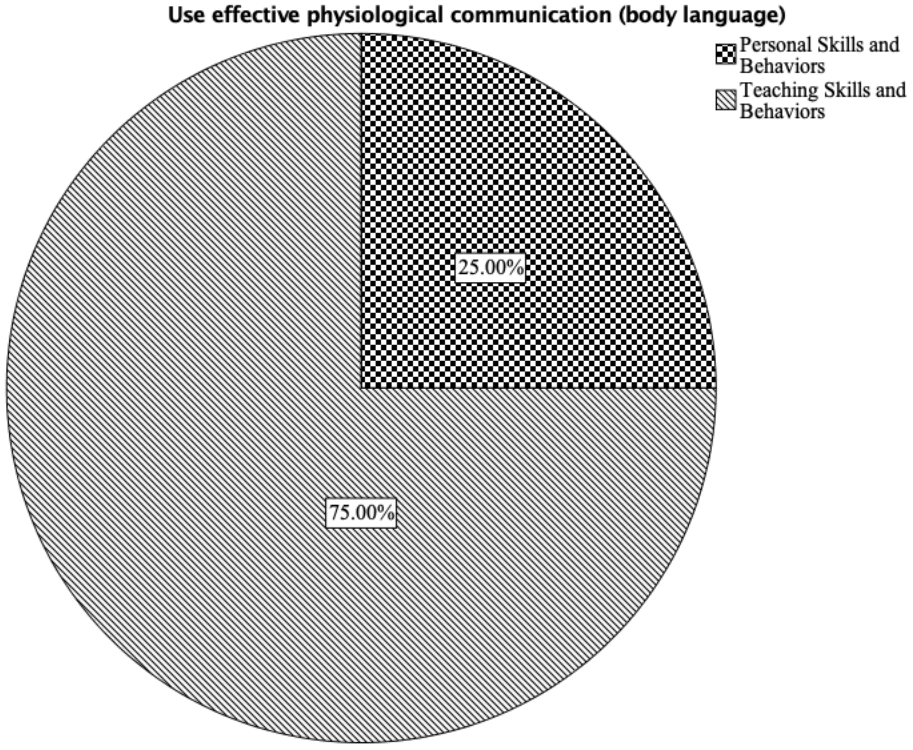

Be goal-oriented
Musical Skills and Behaviors
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
25.00%
62.50%

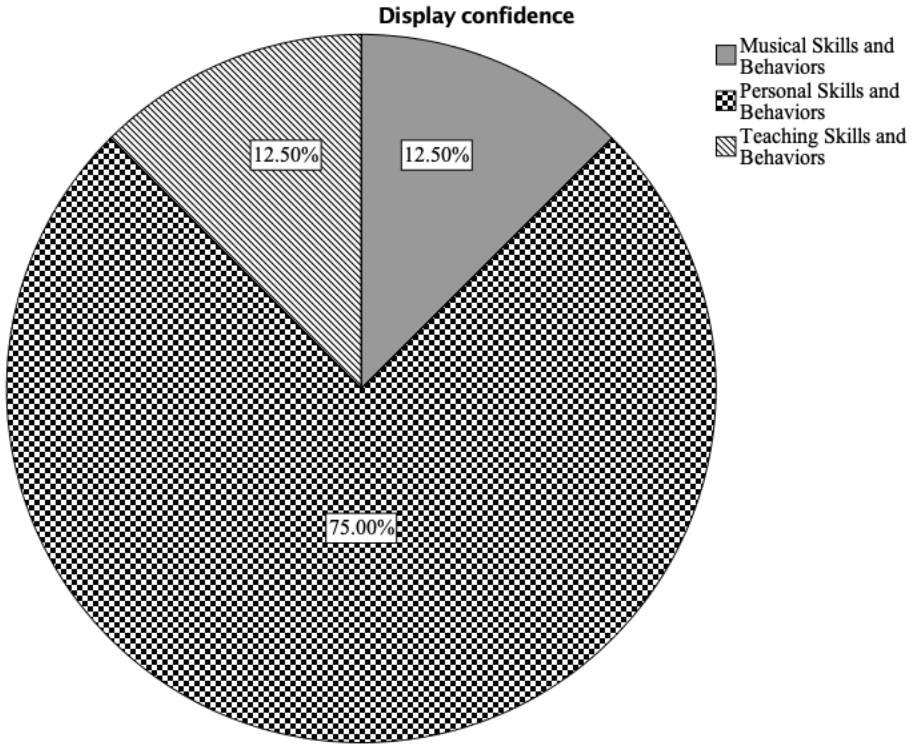

Maintain a high level of professionalism
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

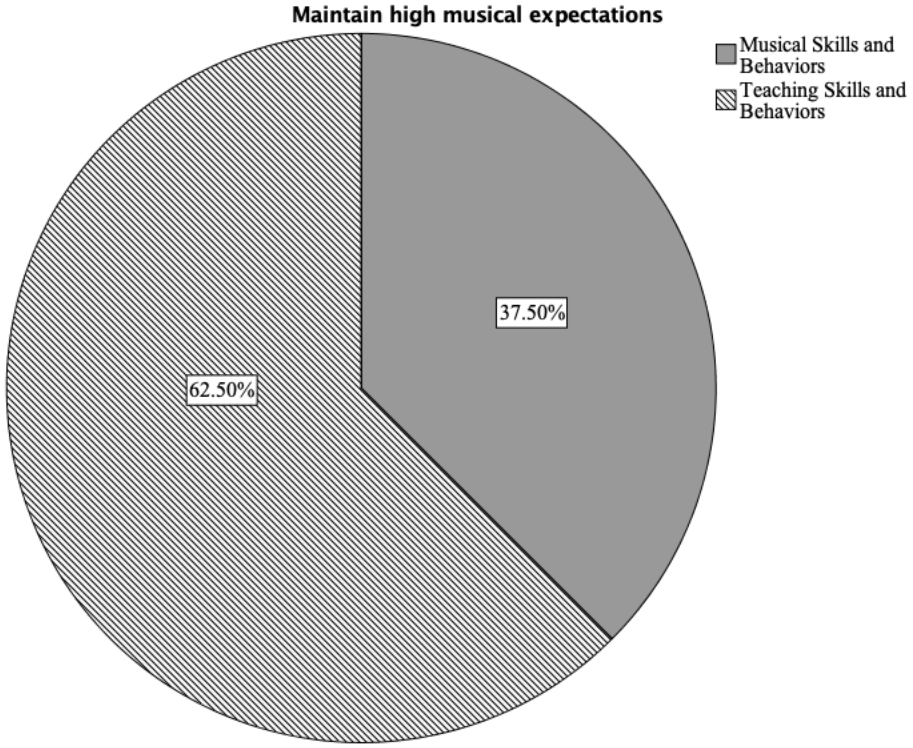

Employ a positive approach
Personal Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

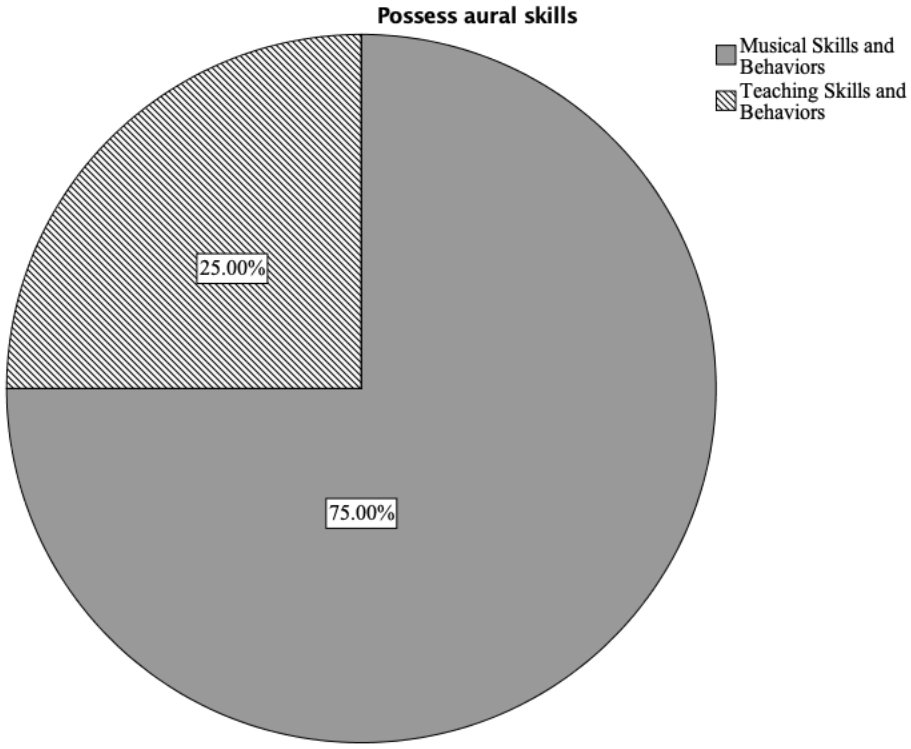

Incorporates singing when teaching
Musical Skills and Behaviors
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
50.00%
12.50%

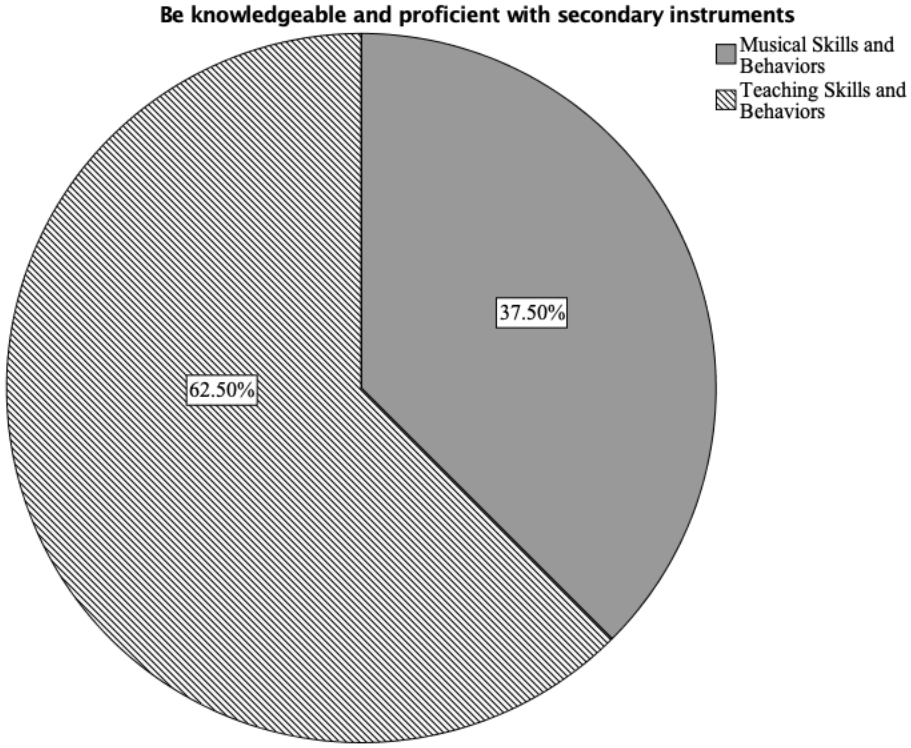

Possess musical knowledge (theory, history, etc.)
Musical Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%

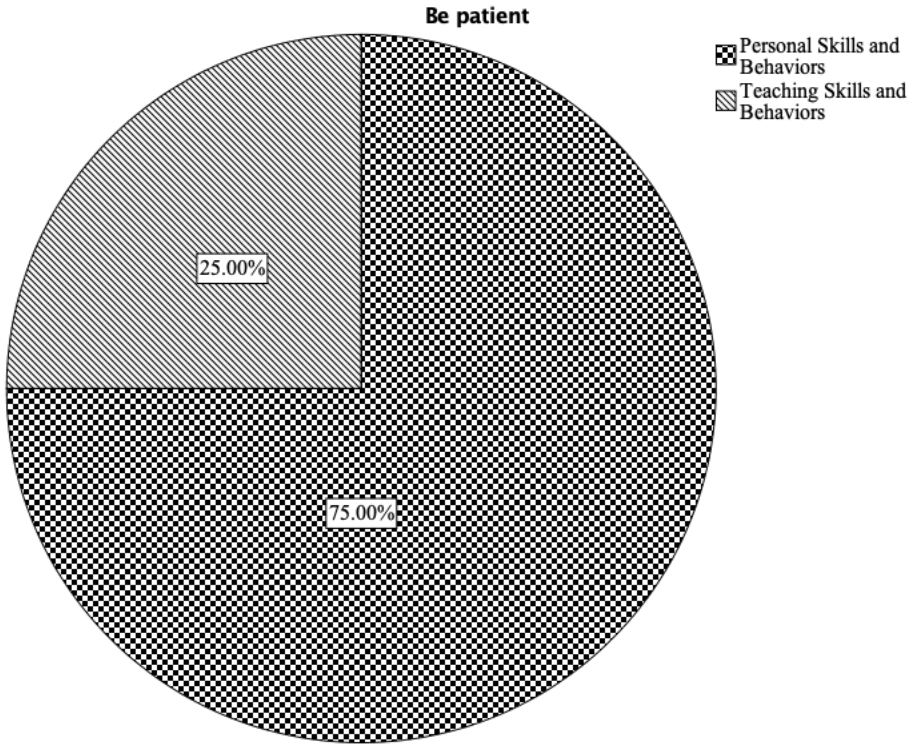

Use effective physiological communication (body language)
Personal Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

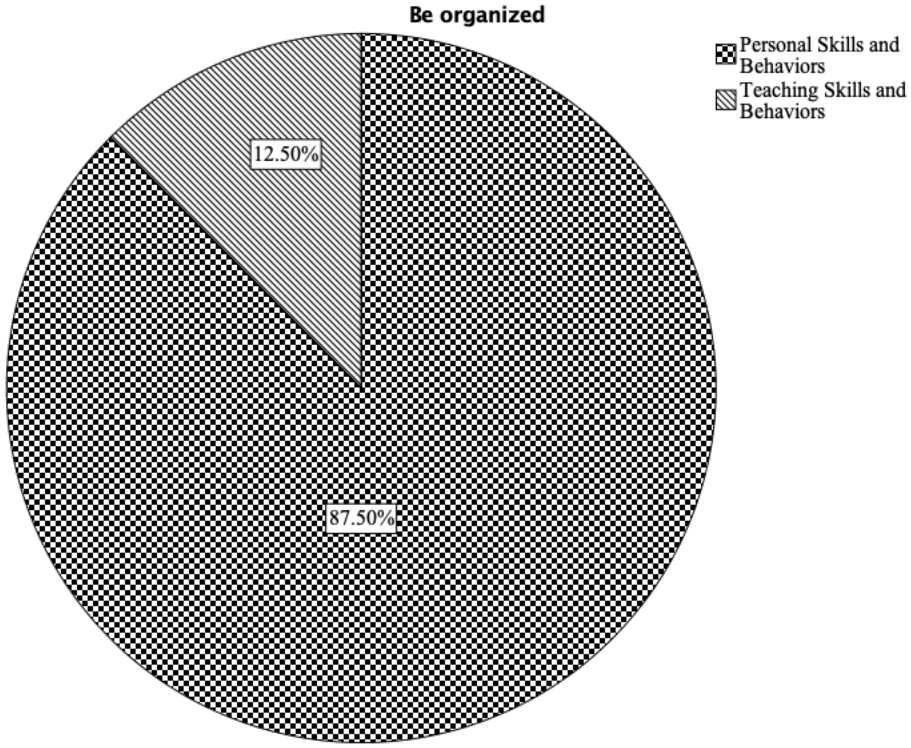

Display confidence
Musical Skills and Behaviors
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
12.50%
75.00%

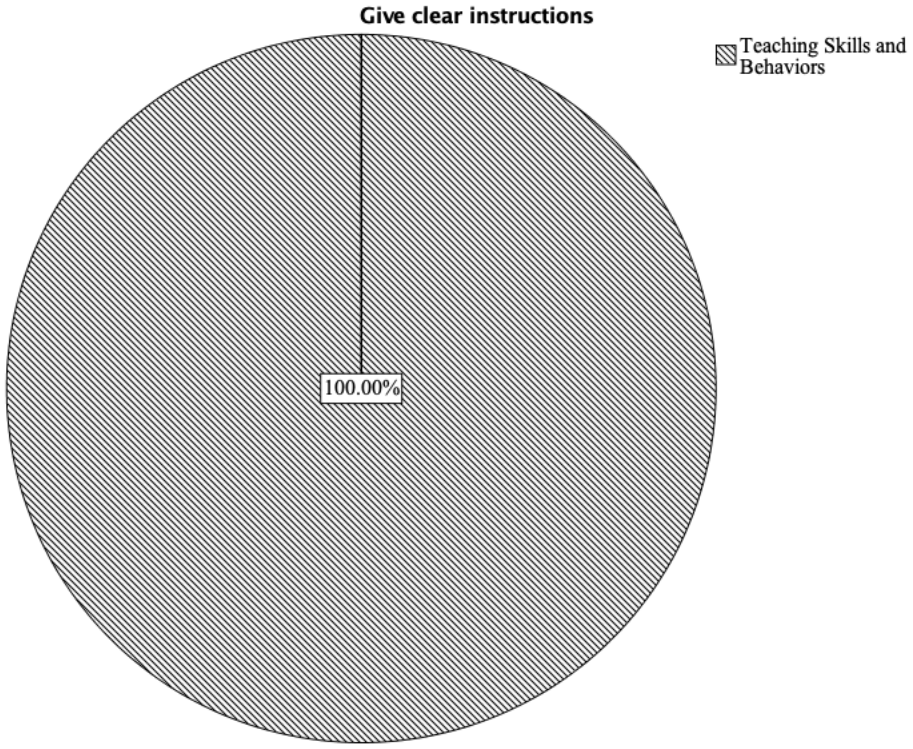

Maintain high musical expectations
Musical Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

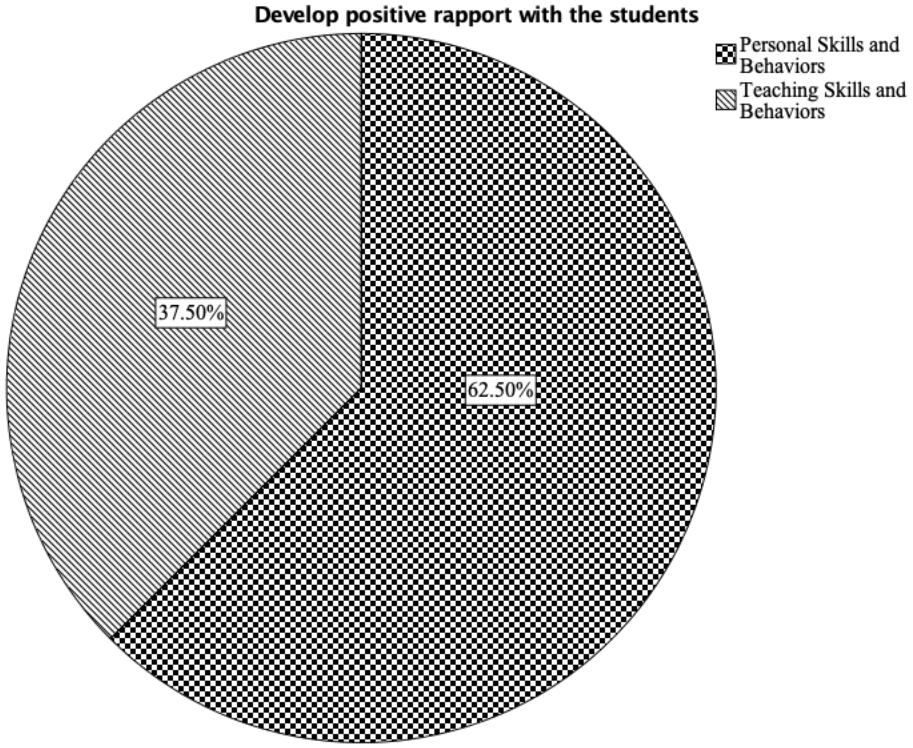

Possess aural skills
Musical Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

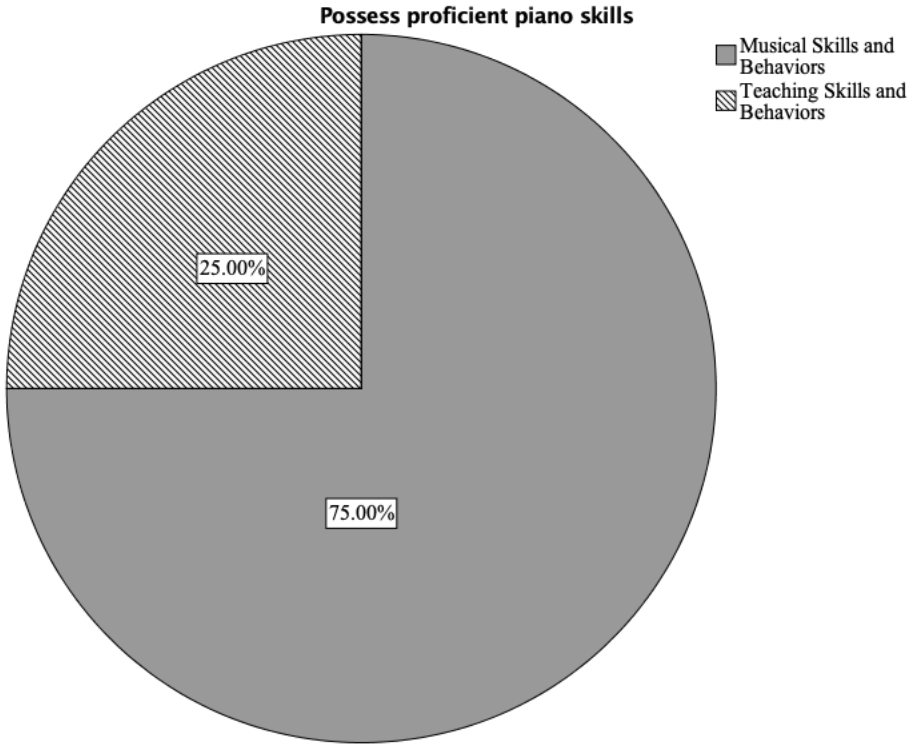

Be knowledgeable and proficient with secondary instruments
Musical Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

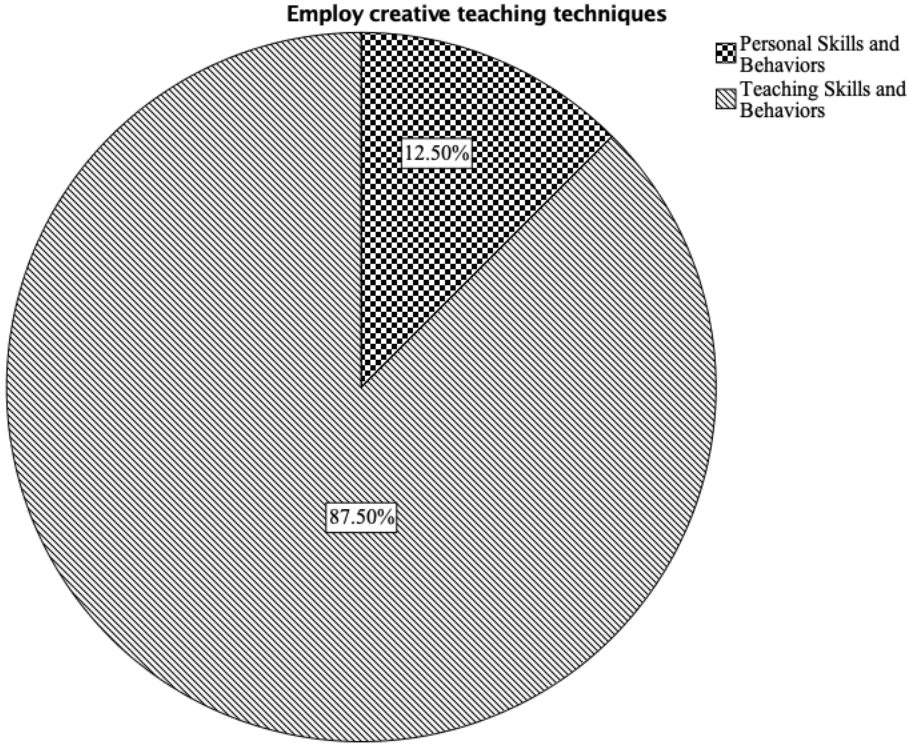

Be patient
Personal Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

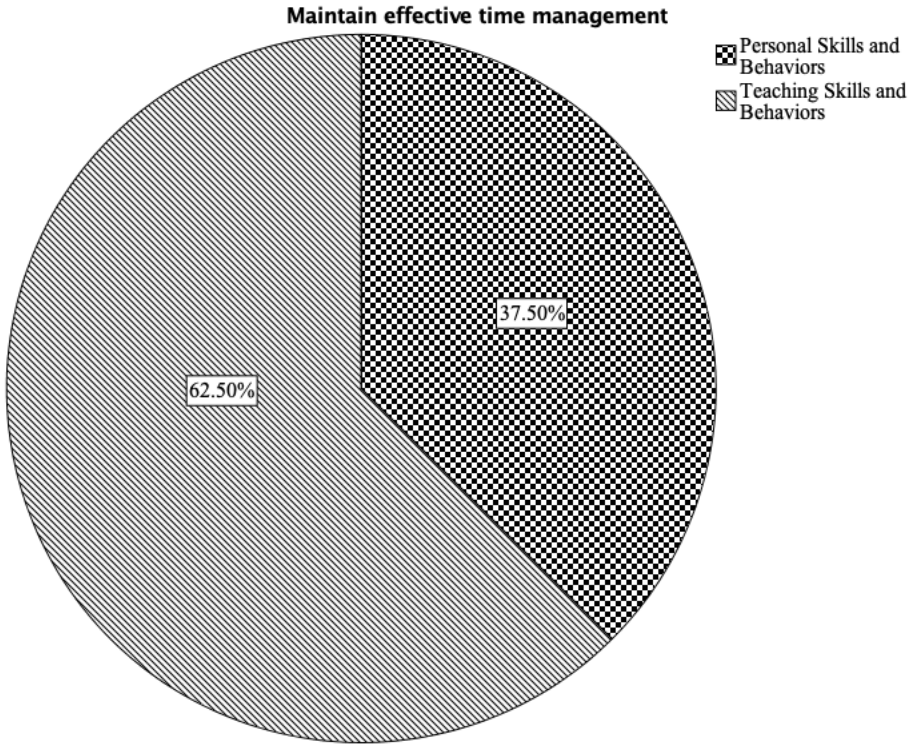

Be organized
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%

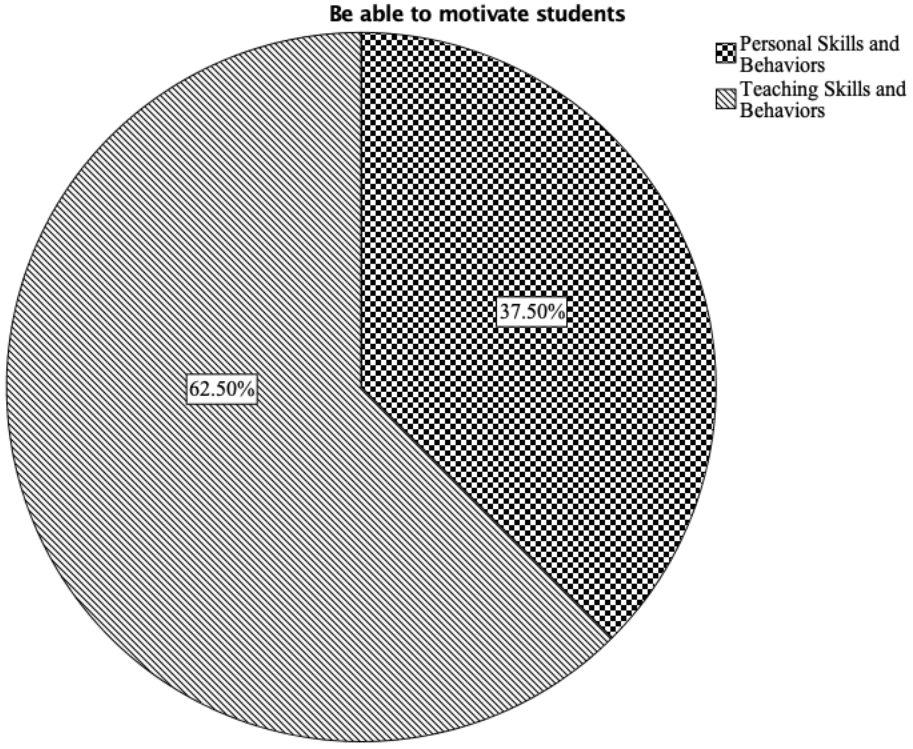

Give clear instructions
Teaching Skills and Behaviors
100.00%

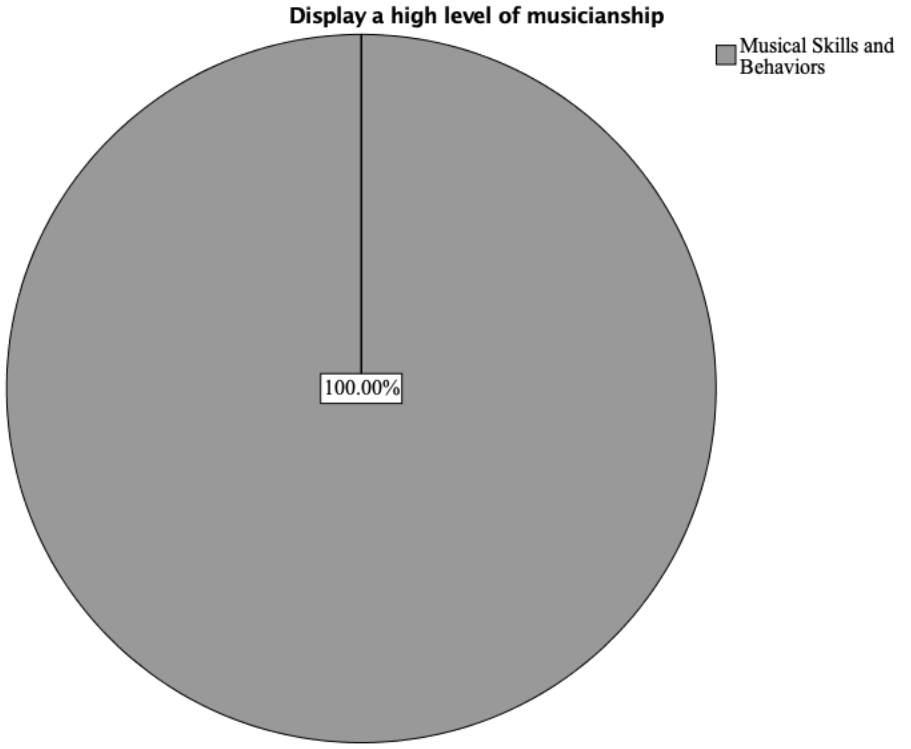

Develop positive rapport with the students
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

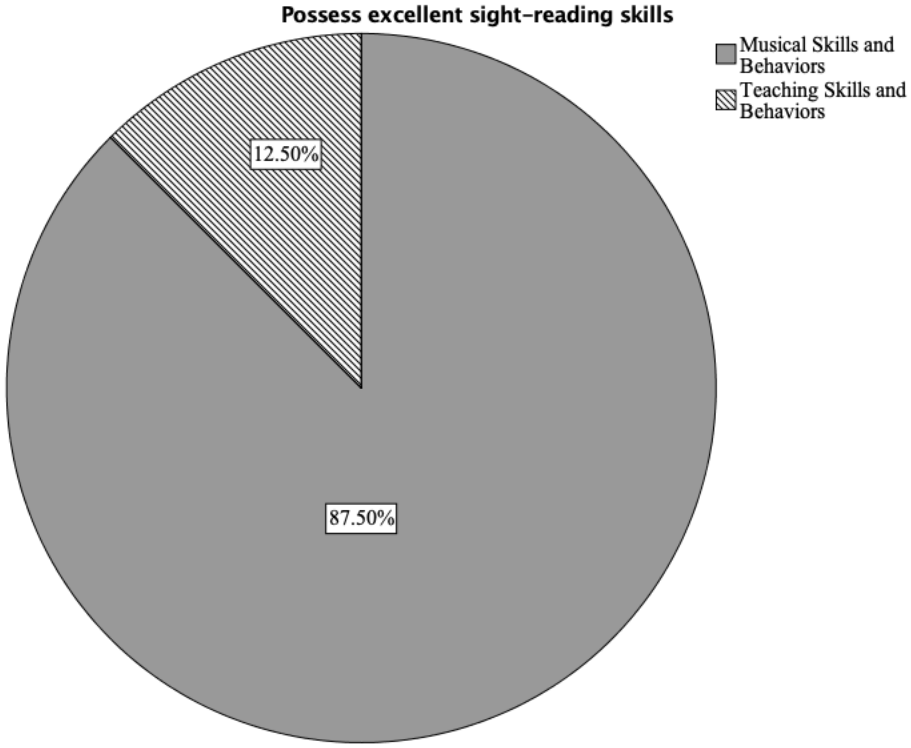

Possess proficient piano skills
Musical Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

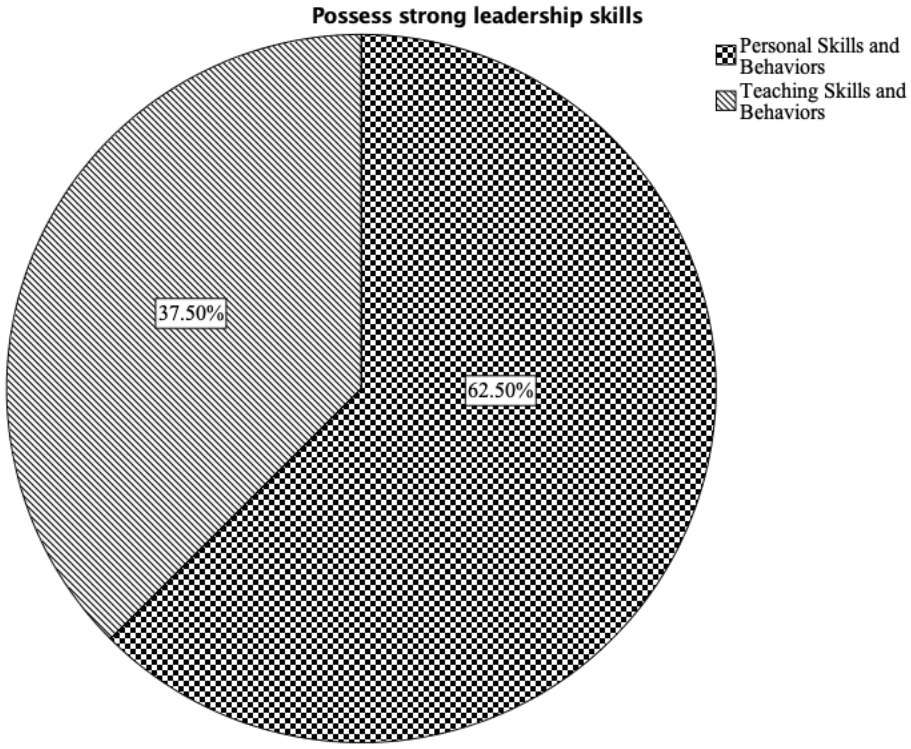

Employ creative teaching techniques
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%

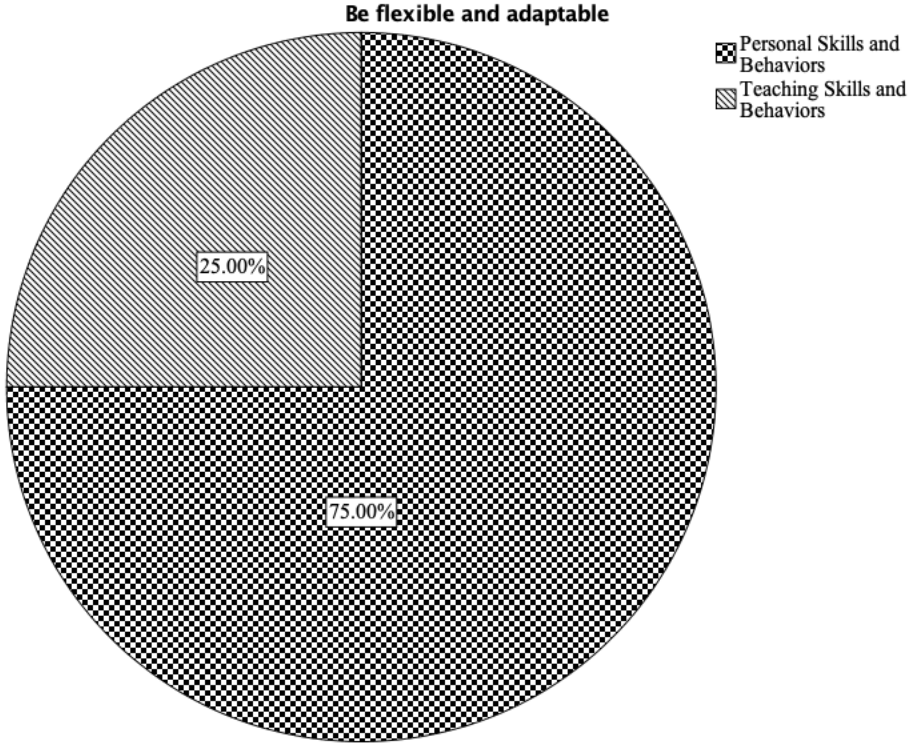

Maintain effective time management
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

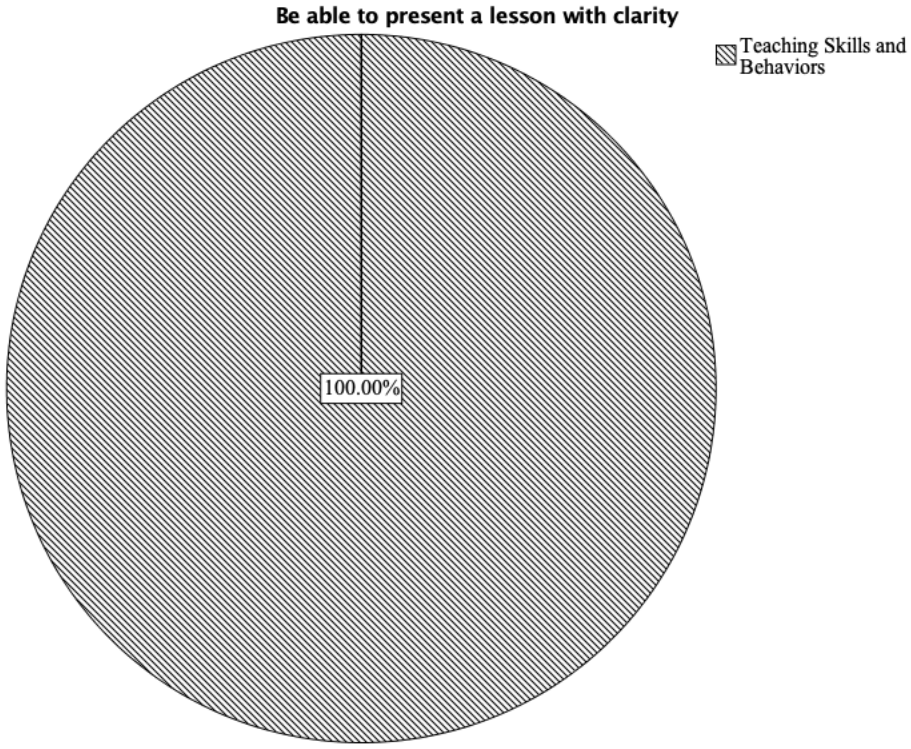

Be able to motivate students
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

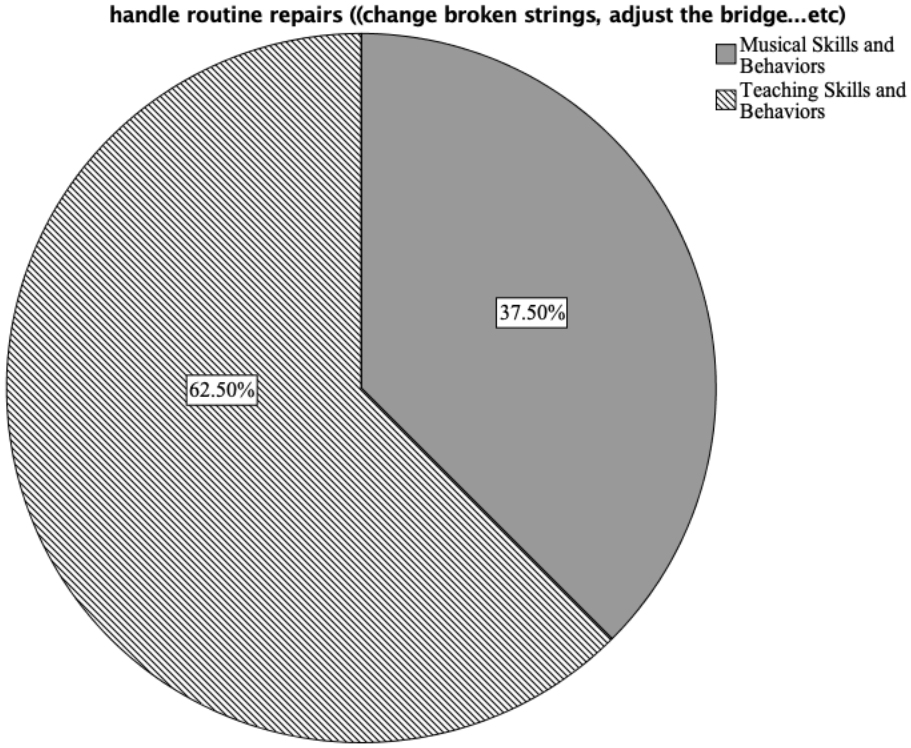

Display a high level of musicianship
Musical Skills and Behaviors
100.00%

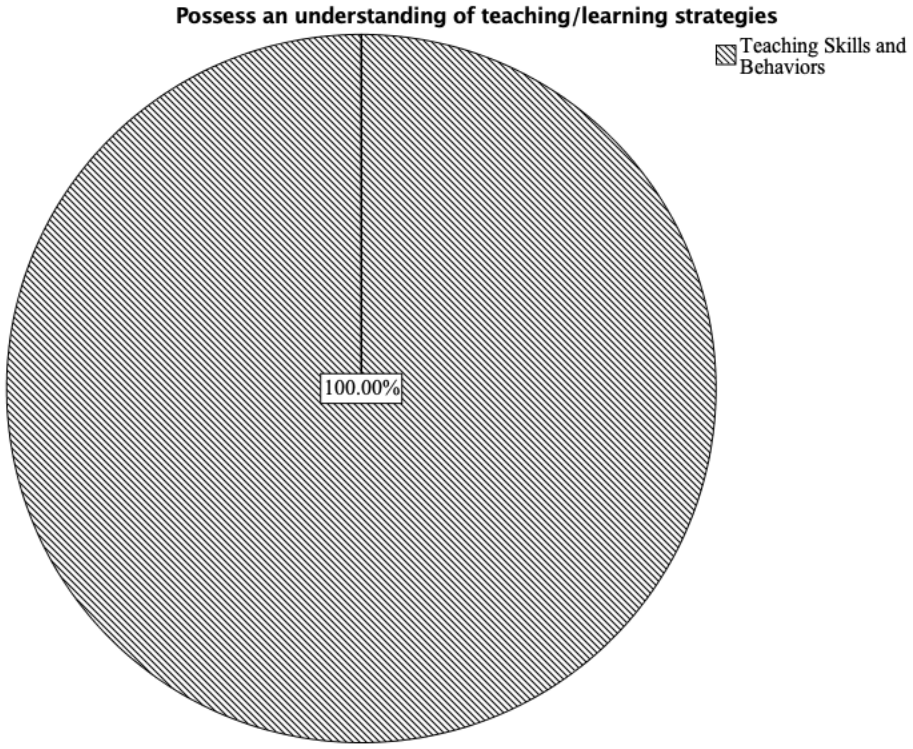

Possess excellent sight-reading skills
Musical Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%

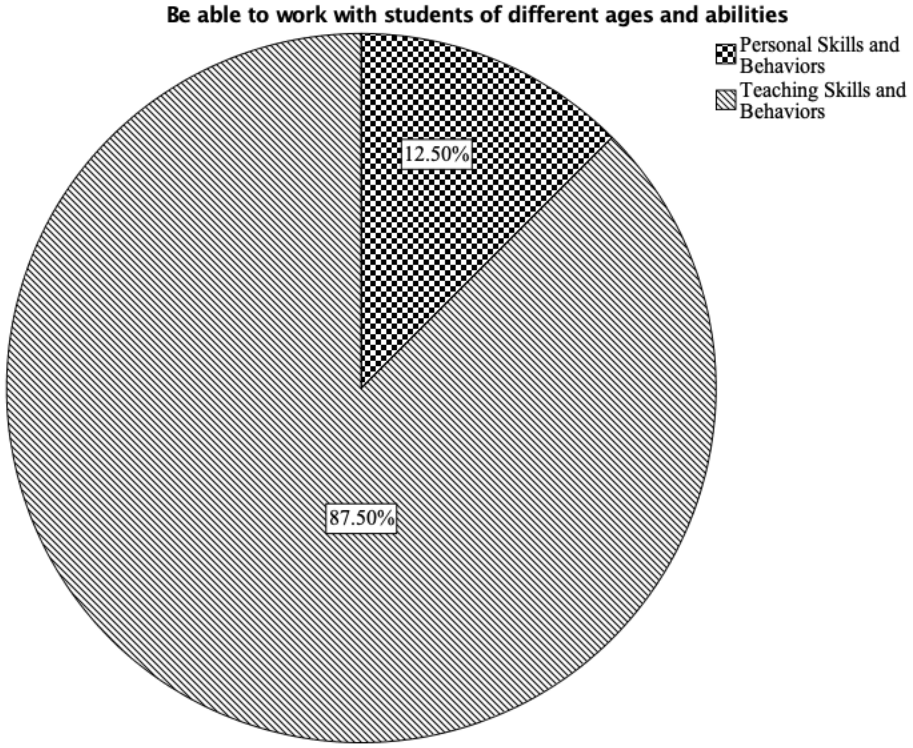

Possess strong leadership skills
Personal Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%

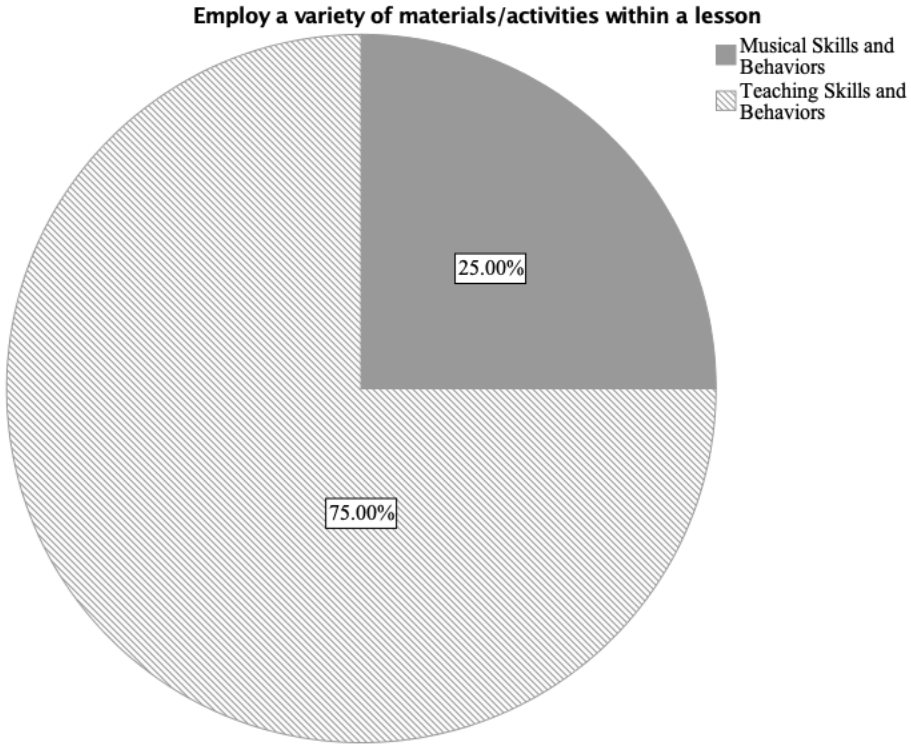

Be flexible and adaptable
Personal Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%

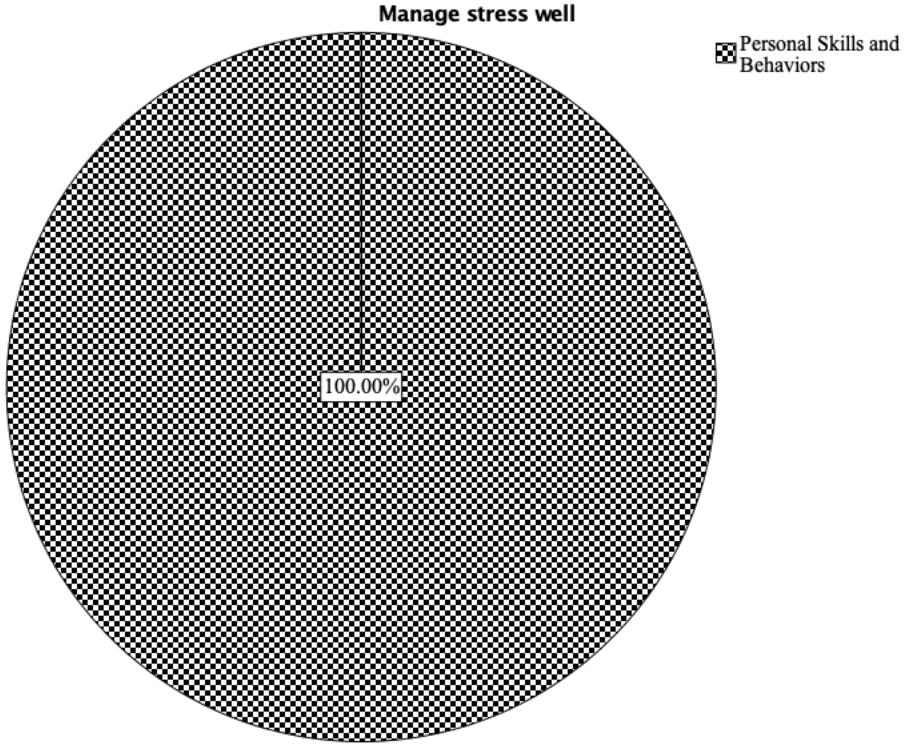

Be able to present a lesson with clarity
Teaching Skills and Behaviors
100.00%

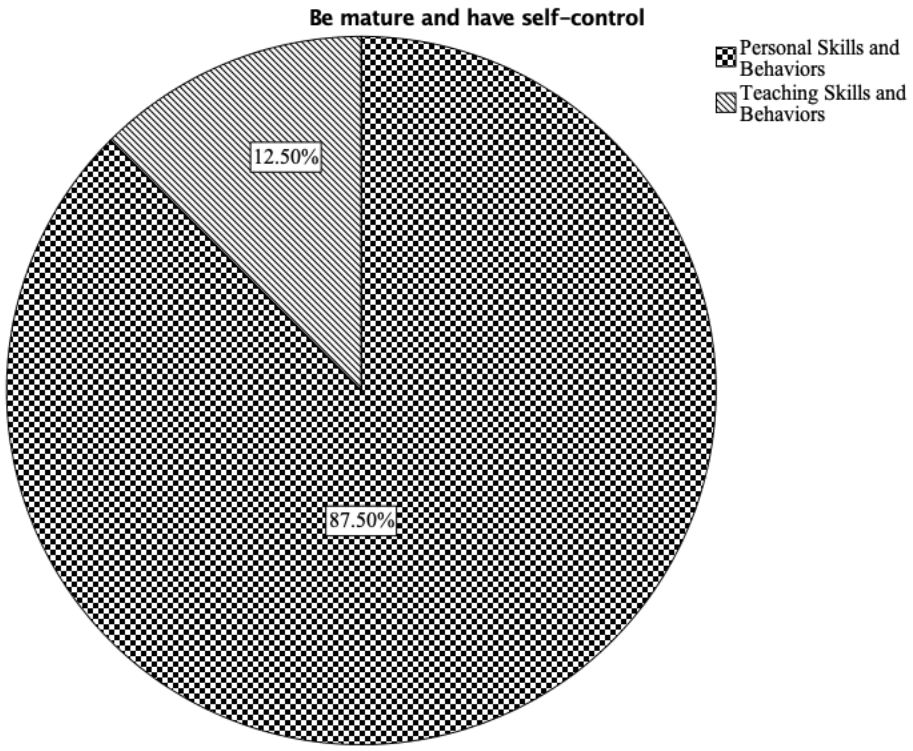

handle routine repairs ((change broken strings, adjust the bridge...etc)
Musical Skills and Behaviors
Teaching Skills and Behaviors
37.50%
62.50%


Possess an understanding of teaching/learning strategies
Teaching Skills and Behaviors
100.00%


Be able to work with students of different ages and abilities
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%


Employ a variety of materials/activities within a lesson
Musical Skills and Behaviors
Teaching Skills and Behaviors
25.00%
75.00%


Manage stress well
Personal Skills and Behaviors
100.00%


Be mature and have self-control
Personal Skills and Behaviors
Teaching Skills and Behaviors
12.50%
87.50%

APPENDIX C

STRING PROJECT SURVEY

APPENDIX C

STRING PROJECT SURVEY

Thank you for participating in this study. This survey will take up to 10 minutes to complete.

I am 18 or older and would like to participate in the study.

Demographic and Background Information (Section 1)

1. **What state are you currently teaching in? * I identify as ...**

   Mark only one oval.

   Male Female Other

2. **How old are you? (Please enter number of years) ***

3. **I am a ***

   Music Education major

   Music Performance major

   Other music major

   Other major

4. **I am or have been a (Check all that apply) *** *Check all that apply.*

   Master Teacher

   String Project Teacher (Undergraduate Student)

   String Project Teacher (Graduate Student)

   String Project director or other administrator

5. **Including this semester, how long have you been teaching in the String Project? *** *Mark only one.*

   One semester or less 2 semesters

   3 semesters

   4 semesters

   5 semesters

   6 semesters

   7 semesters

8 semesters

More than 8 semesters

6. **Describe any additional teaching experience outside of the String Project**

Please rate the importance of each of the following statements based on what you think is important in teaching at the string project (group instruction and/or private lesson) (Section 2)

String Project teachers need to:

1. **Be enthusiastic, energetic**
   1. Less important
   5. Very Important
2. **Maximize time on task**
   1. Less important
   5. Very Important
3. **Involve students in the learning process**
   1.Less important
   5. Very Important
4. **Possess competent conducting gestures**
   1. Less important
   5. Very Important
5. **Maintain student behavior (strong, but fair discipline)**
   1. Less Important
   5. Very Important
6. **Have a pleasant affect; sense of humor**
   1. Less important
   5. Very important
7. **Be knowledgeable of subject matter**
   1. Less important
   5. Very important
8. **Possess good lesson planning skills**
   1. Less important
   5. Very important

9. Maintain an effective pace

1. Less important

5. Very important

10. Frequently make eye contact with students

1. Less important

5. Very important

11. Move around the classroom

1. Less Important

5. Very important

12. Be goal oriented

1. Less important

5. Very important

13. Maintain a high level of professionalism

1. Less important

5. Very important

14. Employ a positive approach

1. Less important

5. Very important

15. Incorporate singing when teaching

1. Less important

5. Very important

16. Possess musical knowledge (theory, history, etc.)

1. Less important

5. Very important

17. Use effective physiological communication (body language)

1. Less important

5. Very important

18. Display confidence

1. Less important

5. Very important

19. Maintain high musical expectations

1. Less important

5. Very important

20. Possess aural skills

1. Less important

5. Very important

21. **Be knowledgeable and proficient with secondary instruments**

1. Less important

5. Very important

22. **Be patient**

1. Less important

5. Very important

23. Be organized

1. Less important

5. Very important

24. Give clear instructions

1. Less important

5. Very important

25. Develop positive rapport with the students

1. Less important

5. Very important

26. Possess proficient piano skills

1. Less important

5. Very important

27. Employ creative teaching techniques

1. Less important

5. Very important

28. Maintain effective time management

1. Less important

5. Very important

29. Be able to motivate students

1. Less important

5. Very important

30. Display a high level of musicianship

1. Less important

5. Very important

31. Possess excellent sight-reading skills

1. Less important

5. Very important

32. Possess strong leadership skills

1. Less important

5. Very important

33. Be flexible and adaptable

1. Less Important

5. Very important

34. Be able to present a lesson with clarity

1. Less important

5. Very important

35. Handle routine repairs (change broken strings, adjust the bridge...etc)

1. Less important

5. Very Important

36. Possess an understanding of teaching/learning strategies

1. Less important

5. Very Important

37. Be able to work with students of different ages and abilities

1. Less important

5. Very Important

38. Employ a variety of materials/activities within a lesson

1. Less important

5. Very important

39. Manage stress well

1. Less important

5. Very important

40. Be mature and have self-control

1. Less important

5. Very important

Personal Interview (Section 3)

Thank you very much for completing the survey. If you would like to be considered for a follow up interview, please leave your contact information below. Your information will remain confidential if you decide to do an interview with me.

First name

Last name

Email:

Phone number:

APPENDIX D

STRING PROJECTS DATABASE

APPENDIX D

STRING PROJECTS DATABASE

#	String Project Site	Year Started	State/City	Director Name	Phone #	Email	Website
1	University of Arizona	2017	Tucson, Arizona	Dr. Theodore Buchholz	217 520-621 (7012)	buchholz@email.arizona.edu	
2	California State University Sacramento	2001	Sacramento, California	Andrew Luchansky	(916) 278-7985	aluchansky@csus.edu	http://www.csus.edu/stringproject/
3	Point Loma Nazarene University	2003	San Diego, California	Dr. Phil Tyler		philiptyler@pointloma.edu	https://www.pointloma.edu/opportunities/point-loma-string-project
4	University of Redlands	2011	Redlands, California	Dr. Kyle Champion	Community School of Music and the Arts 909-748-8844.	championcello@usa.net	
5	University of Northern Colorado	2017	Greeley, Colorado	Dr. Linsday Fulcher	(970) 351-2328	Lindsay.Fulcher@unco.edu	http://arts.unco.edu/music/string-project/
6	University of Hartford	2000	West Hartford, CT	Dr. Joshua Russell	860.768.4127	jorussell@hartford.edu	http://uhaweb.hartford.edu/STPROJECT/
7	Kennesaw State University	2012	Kennesaw, GA	Christopher Thibdeau			http://www.kennesawstringproject.org/

#	String Project Site	Year Started	State/City	Director Name	Phone #	Email	Website
8	University of Georgia	2001	Athens, GA	Dr. Skip Taylor and Ruth Monson, co-directors	(706) 542-2894	ugasp@uga.edu	http://www.music.uga.edu/string-project
9	Valdosta State University	2001	Valdosta, GA	Dr. Kristin Pfeifer Yu	229-259-2087	sgsp@valdosta.edu	http://www.valdostasymphony.org/sgsp/
10	Illinois State University	2002	Normal, IL	Dr. Adriana Ransom	309-438-8009	aransom@ilstu.edu	https://finearts.illinoisstate.edu/string-project/
11	Northern Kentucky University	2012	Highland Heights, KY	Dr. Amy Gillingham	859-572-1568	gillinghaa1@nku.edu	http://musicprep.nku.edu/stringproject.html
12	University of Kentucky	2000	Lexington, KY	Dr. Wendy Yates		wendy.yates236@uky.edu (Coordinator)	https://finearts.uky.edu/music/university-kentucky-string-project
13	McNeese State University	2011	Lake Charles, LA	Dr. Lonny Benoit	337-475-5466	lbenoit@mcneese.edu	https://www.mcneese.edu/performingarts
14	University of Massachusetts	2000	Lowell, MA	Kay Roberts	(978) 934-4000	Kay_Roberts@uml.edu	https://www.uml.edu/fahss/music/String-Project/
15	University of Southern Mississippi	2015	Hattiesburg, MS	Gladys Gonzalez	601.408.0755	smkostrings@gmail.com	https://www.usm.edu/music/nspc
16	University of Nebraska-Kearney	2008	Kearney, NE	Dr. Eunkyung Son	Department of Music, Theatre, and Dance at (308) 865-8618	sone2@unk.edu strings@unk.edu	http://www.unk.edu/academics/music/unk-string-project.php
17	University of	2016	Lincoln, NE	Dr. Karen Becker	402-472-4253	kbecker2@unl.edu	https://arts.unl.edu/music/string-project

#	String Project Site	Year Started	State/City	Director Name	Phone #	Email	Website
	Nebraska-Lincoln						
18	Crane School of Music, SUNY Potsdam	2004	Potsdam, NY	Jennifer Kessler Sarah Hersh Jessica Suchy-Pilalis Lori Dillon, NSP Secretary	314.267.2411	kesslejk@potsdam.edu hershss@potsdam.edu suchyjr@potsdam.edu dillonlk@potsdam.edu	http://cranensp.weebly.com/
19	Ithaca College	2008	Ithaca, NY	Julie Along Carr	(607) 274-3171	jcarr@ithaca.edu	https://www.ithaca.edu/music/education/teachingprograms/soar/
20	University of Oklahoma	2001	Norman, OK	Dr. Beth Sievers	(405) 325-0919	bsievers@ou.edu	http://soonerstringproject.oucreate.com/StringProject.html
21	Pacific University	2012	Forest Grove, OR	Dr. Dijana Ihas	503-352-2102	dihas@pacificu.edu	https://www.pacificu.edu/arts/pacific-university-string-project
22	Indiana University of Pennsylvania	2004	Indiana, PA	Dr. Linda Jennings	724-357-2649	ljenning@iup.edu	https://www.iup.edu/stringproject/
23	Marywood University	2001	Scranton, PA	Sophie Till	570-348-6268 extension 2378	sophietill@marywood.edu	http://www.marywood.edu/stringproject/about.html
24	Temple University	2010	Philadelphia, PA	Program Coordinator: Melissa Douglas	215.204.8326	musicprep@temple.edu	http://www.temple.edu/boyer/musicprep/programs/CommunityMusicScholars.htm
25	University of South Carolina	1974	Columbia, SC	(Director) Dr. Gail Barnes Mrs. Salehi?	803-777-9568	uscsp@mozart.sc.edu	http://www.sc.edu/study/colleges_schools/music/community/community_music_school/string_project/

#	String Project Site	Year Started	State/City	Director Name	Phone #	Email	Website
26	South Dakota State University	2012	Brookings, SD	Dr. John Brawand	605-688-4414	john.brawand@sdstate.edu	https://www.sdstate.edu/music/music/sdsu-string-project
27	Tennesse Tech String Project	2016	Cookeville, TN	Daniel Allcott / Sarah McKelvie	Daniel: 931-372-6179 Sarah: 931-372-3161	dallcott@tntech.edu smckelvie@tntech.edu	https://www.tntech.edu/fine-arts/music/community-programs/string-project/faculty
28	University of Tennessee at Chattanooga	2001	Chattanooga, TN				
29	Baylor University	2007	Waco, TX	Dr. Michael Alexander Mrs. June Campbell	Dr. Michael (254) 710-6579	Michael_L_Alexander@baylor.edu June_Campbell@baylor.edu	https://www.baylor.edu/music/index.php?id=940002
30	Texas State University	2010	San Marcos, TX	Dr. Ames Asbell	512-245--3391	stringproject@txstate.edu	http://www.music.txstate.edu/stringproject/
31	Texas Tech University	2001	Lubbock, TX	Dr. Blair Williams	(806) 834-2992	blair.williams@ttu.edu	http://www.depts.ttu.edu/music/areasofstudy/stringproject.php
32	University of North Texas		Denton, TX	Dr. Elizabeth Chappell	940-565-3730	Elizabeth.Chappell@unt.edu	http://musiced.music.unt.edu/string-project
33	University of Texas-Austin	1948	Austin, TX	Dr. Laurie Scott	512-471-2496	lascott@austin.utexas.edu	http://stringproject.music.utexas.edu/
34	University of Texas-San Antonio	2002	San Antonio, TX	Dr. Eugene Dowdy	(210) 458-5683	eugene.dowdy@utsa.edu	http://music.utsa.edu/areas/utsa-string-project-faculty

#	String Project Site	Year Started	State/City	Director Name	Phone #	Email	Website
35	University of Texas-El Paso	2016	El Paso, TX	Dr. Stephanie Meyers	(915) 747-7810	smeyers@utep.edu	https://academics.utep.edu/Default.aspx?alias=academics.utep.edu/stringproject
36	Weber State University	2001	Ogden, UT	Dr. Francisco de Galvez	801-626-6991	fdegalvez@hotmail.com	https://www.weber.edu/wsustringproject
37	James Madison University	2007	Harrisonburg, VA	Dr. Lisa Maynard	540/568-6465	maynarlm@jmu.edu	http://www.jmu.edu/music/people/profiles/education-profiles/maynard-lisa.shtml
38	Virginia Tech	2007	Blacksburg, VA	Nicole Paglialonga		npag@vt.edu	http://www.performingarts.vt.edu/study-with-us/community-education-and-outreach-programs/virginia-tech-string-project
39	University of Wyoming	2000	Laramie, WY	James Przygocki	307-766-3335	przygcki@uwyo.edu	http://www.uwyo.edu/music/string_project/
40	ASU		Tempe, AZ	Dr. Margaret Schmidt	480) 965-2659	stringproject@asu.edu	https://music.asu.edu/string-project

APPENDIX E

STRING PROJECT DIRECTORS COVER LETTER

APPENDIX E

STRING PROJECT DIRECTORS COVER LETTER

Dear (name of the director of the string project),

I am a doctoral student under the direction of Dr. Margaret Schmidt in the school of music at Arizona State University. I am conducting a study examining the perspectives of undergraduate and graduate student teachers, master teachers, and directors who work in string project across the United States about the skills, characteristics, and instructional behaviors important to string teaching.

My intention is to administer a survey to String Project directors, master teachers, and student involved in the String Project. I am inviting participation from every String Project listed on the National String Project Consortium website in order to explore the perspectives of string teachers involved in these wonderful programs that help future teachers gain more hands-on teaching experience

Participation in this study is voluntary and involves completing an online survey. The survey will take approximately 10 minutes to complete. The identity of the respondents will be kept anonymous and only background information such as age, gender, and years of experience will be collected. Additionally, I am also interested to conduct interviews with some participants, so I will be asking the participants to leave their contact information if they would volunteer to do an interview with me later.

I would be very grateful to you if you could let me know:

1. Are you willing to forward an invitation email to the student teachers and master teachers working at the string project?
2. If you are willing to help with this study, how many student teachers and master teachers you anticipate forwarding this invitation to?

If you have any questions concerning this study, please contact Dr. Margaret Schmidt at marg.schmidt@asu.edu, or me at Yousef.alsayegh@asu.edu

Thank you very much in advance and I look forward to hearing back from you soon.

Sincerely,
Yousef Alsayegh

APPENDIX F

PARTICIPANTS RECRUITMENT COVER LETTER

APPENDIX F

PARTICIPANTS RECRUITMENT COVER LETTER

Dear String Project teachers,

I am doctoral student under the direction of Dr. Margaret Schmidt in the School of Music at Arizona State University. I would like to invite your participation in a study that examines the perspectives of undergraduate and graduate student teachers, master teachers, and directors who work in string projects across the United States. I am interested in examining the teachers' perspectives about the skills, characteristics, and instructional behaviors important to string teaching.

Participation in this study entails completing a short electronic survey that will less than 10 minutes to complete. The survey lists skills, characteristics, and instructional behaviors in music teaching, and asks you to rate the importance of each statement based on your own teaching.

Please follow the link below to start the survey.

By taking the survey, you are acknowledging that you are 18 or older and consenting to be included in the study. Your participation in the study is voluntary. If you have any questions concerning the research, please contact Dr. Schmidt at marg.schmidt@asu.edu, or contact me at yousef.alsayegh@asu.edu

Thank you in advance for helping me with this survey.

Sincerely,

Yousef Alsayegh

APPENDIX G

STRING PROJECT INTERVIEW PROTOCOL

APPENDIX G

STRING PROJECT INTERVIEW PROTOCOL

1. Describe your role at the String Project?
2. Tell me about your experience teaching at the String Project?
3. What skills did you find important at the String Project?
4. What do you hope to learn while teaching at the String Project?
5. How did you get involved in String Project?
6. Tell me about how you prepare for teaching at the String Project?
7. What did teaching at the String Project add to your teaching?
8. If there is one thing that you learned from teaching at the String Project, what would that be?
9. In your opinion, what are the advantages and disadvantages of teaching at the String Project?
10. Tell me about the challenges that you encountered while teaching at the String Project?
11. How has your teaching experience at the String Project benefited you personally?
12. Describe how teaching with a master teacher affected your teaching skills?
13. Who are you learning from when you are teaching at the String Project? (Director, master teacher, fellow teacher, your students, your lesson plan, feedback from you master teacher)
14. Describe the most valuable lesson you learned from being involved at the String Project.
15. How did your teaching change from your first day at the String Project until this day?
16. How prepared do you think you are after your teaching experience at the string project?

APPENDIX H

IRB APPROVAL LETTER

APPENDIX H

IRB APPROVAL LETTER

EXEMPTION GRANTED

Margaret Schmidt
Music, School of
480/965-8277
Marg.Schmidt@asu.edu

Dear Margaret Schmidt:

On 2/20/2018 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	An investigation of String Project Master and Student Teachers' Perspectives on Skills, Characteristics, and Instructional Behaviors important for String Teaching.
Investigator:	Margaret Schmidt
IRB ID:	STUDY00007769
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• String Project Survey - Google Forms.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment Letter, Category: Recruitment Materials; • String Project Study IRB Form, Category: IRB Protocol; • Participants Cover Letter.pdf, Category: Consent Form;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 2/20/2018.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

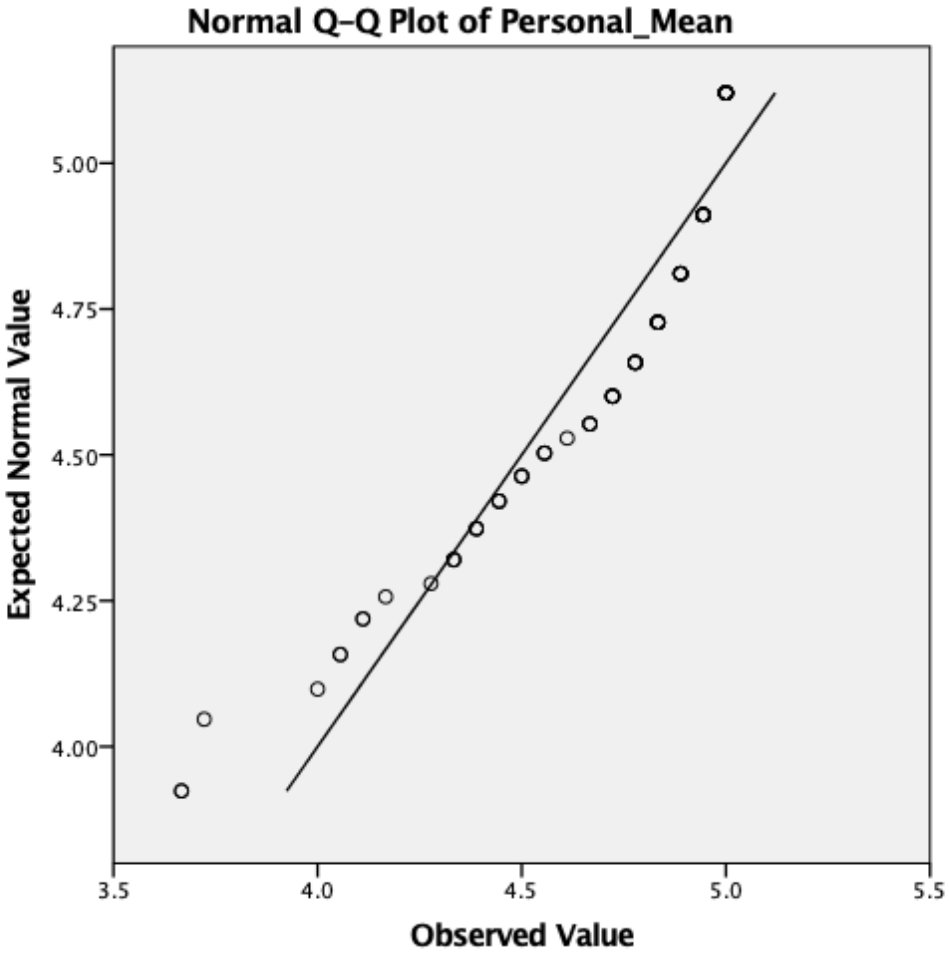
Sincerely,

APPENDIX I

QQ PLOT FOR PERSONAL SKILLS AND BEHAVIORS

APPENDIX I

QQ PLOT FOR PERSONAL SKILLS AND BEHAVIORS

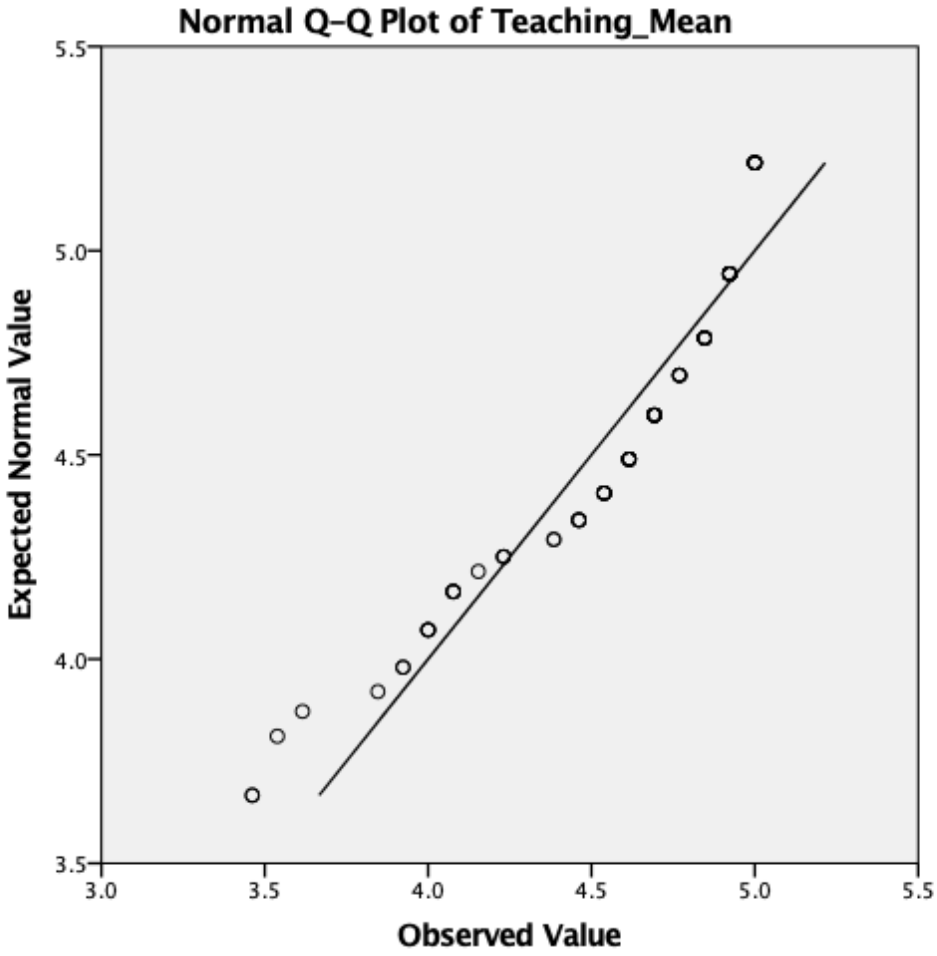


APPENDIX J

QQ PLOT FOR TEACHING SKILLS AND BEHAVIORS

APPENDIX J

QQ PLOT FOR TEACHING SKILLS AND BEHAVIORS

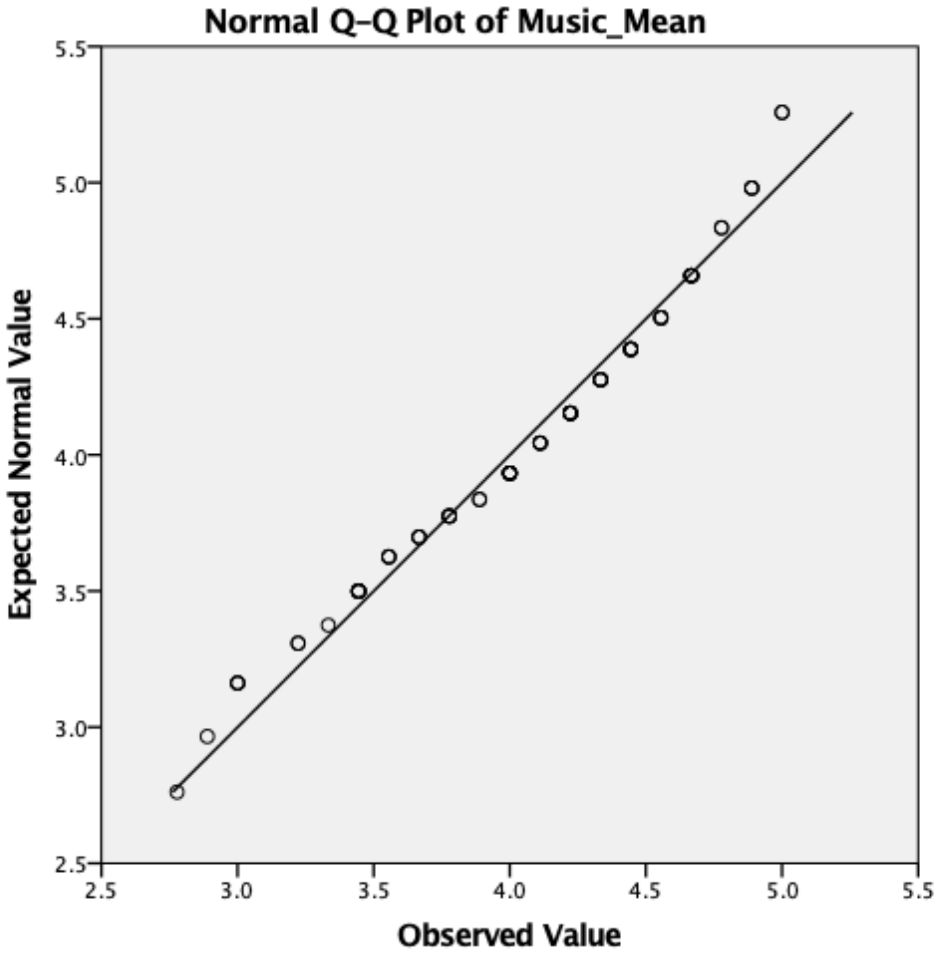


APPENDIX K

QQ PLOT FOR MUSICAL SKILLS AND BEHAVIORS

APPENDIX K

QQ PLOT FOR MUSICAL SKILLS AND BEHAVIORS



APPENDIX L

EXPERTS' ASSESSMENTS OF PERSONAL, TEACHING, MUSICAL SKILLS AND BEHAVIORS

APPENDIX L

EXPERTS' ASSESSMENTS OF PERSONAL, TEACHING, MUSICAL SKILLS AND BEHAVIORS

Assessment of Teaching, Personal, and Musical Skills and behaviors

You can come back later and edit your response to any of the items on the survey if you wish to do so.

* Required

1. **Email address** *

2. **Years of music teaching experience** *

3. **Highest degree earned** *
   Mark only one oval.
   - ◯ Bachelor's Degree
   - ◯ Master's degree
   - ◯ Doctoral Degree

4. **Name** *

Assessment of Teaching, Personal, and Musical Skills and behaviors

Please assign each of the following statements to only one of the three broad categories (Personal. Teaching, and Music skills and behaviors)

5. **Be flexible and adaptable** *
   Mark only one oval.
   - ◯ Teaching skills and Behaviors
   - ◯ Personal Skills and Behaviors
   - ◯ Music Skills and Behaviors

6. **Develop positive rapport with the students** *
   Mark only one oval.
   - ◯ Teaching skills and Behaviors
   - ◯ Personal Skills and Behaviors
   - ◯ Music Skills and Behaviors

7. **Be knowledgeable and proficient with secondary instruments** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

8. **Maximize time on task** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

9. **Maintain effective time management** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

10. **Maintain an effective pace** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

11. **Employ a variety of materials/activities within a lesson** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

12. **Maintain a high level of professionalism** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

13. **Possess excellent sight-reading skills** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

14. **handle routine repairs ((change broken strings, adjust the bridge...etc)** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

15. **Give clear instructions** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

16. **Be organized** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

17. **Be goal-oriented** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

18. **Employ a positive approach** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

19. **Employ creative teaching techniques** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

20. **Possess proficient piano skills** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

21. **Use effective physiological communication (body language)** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

22. **Involve students in the learning process** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

23. **Maintain high musical expectations** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

24. **Possess competent conducting gestures** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

25. **Incorporates singing when teaching** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

26. **Frequently make eye contact with students** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

27. **Be mature and have self-control** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

28. **Maintain student behavior (strong, but fair discipline)** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

29. **Manage stress well** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

30. **Display a high level of musicianship** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

31. **Move around the classroom** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

32. **Be patient** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

33. **Have a pleasant affect; sense of humor** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

34. **Display confidence** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

35. **Be able to work with students of different ages and abilities** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

36. **Be able to present a lesson with clarity** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

37. **Be knowledgeable of subject matter** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

38. **Possess aural skills** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

39. **Be able to motivate students** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

40. **Possess an understanding of teaching/learning strategies** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

41. **Possess musical knowledge (theory, history, etc.)** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

42. **Possess good lesson planning skills** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

43. **Possess strong leadership skills** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors

44. **Enthusiastic, energetic** *
Mark only one oval.

- Teaching skills and Behaviors
- Personal Skills and Behaviors
- Music Skills and Behaviors