LIBERTY UNIVERSITY

SCHOOL OF MUSIC

A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom

A Dissertation Submitted to

the Faculty of the School of Music

in Candidacy for the Degree of

Doctor of Philosophy

by

Jill K. Moth

Lynchburg, Virginia

March 2024

ABSTRACT

Motivation is a topic of high interest to music educators as they attempt to understand what makes their students want to continue learning. The use of the ukulele in the music classroom has grown over the last ten years due to its versatility. Despite its popularity and music educators' support for its use, very little research exists on students' motivation while playing it in a general music classroom setting. Therefore, the purpose of this current study is to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele via different curricula in the music classroom. A quantitative MANOVA design method compared the motivation levels of students experiencing two different ukulele curricula. The study collected quantitative data from (N = 175) fourth through sixth-grade students at Maria Montessori School in Rockford, IL through an adapted twenty-two-item Intrinsic Motivation Inventory (IMI). The results indicated that there was a significant difference in motivation between students who experienced the *Quaver Music* curriculum and students who experienced the *Music Will* curriculum. The largest contributor to the difference is the *Pressure-Tension* subcategory, which leads one to conclude that students who experience lower levels of *Pressure-Tension* experience higher levels of overall motivation. Activities that promote lower levels of *Pressure-Tension* should be utilized in the classroom.

Keywords: motivation, ukulele, curriculum, differentiation, multi-age classrooms, informal learning

Acknowledgements

This doctoral journey has been full of many emotions: excitement, challenge, frustration, and success. I have many people to thank for the ultimate completion of this degree, and if you are reading this, you are likely one of them. First and foremost, I owe my gratitude to my daughter, Giavanna, who has been a daily support as I have gone through this program. I am grateful for your understanding of the time I needed to complete coursework, reading, and writing. I am especially thankful for your encouragement as I went through the process, and your shared excitement as I progressed. You also helped me proofread thousands of numbers and correct entry errors in my data, showing maturity and wisdom beyond your years. To my #1 assistant and the joy of my life, I am forever grateful.

I would also like to express my sincere appreciation to my parents, Bill and Luann. You have supported my educational and personal journey throughout my life, encouraging me to reach my potential by completing advanced degrees, performing music, and teaching music. Thank you for instilling in me this work ethic and drive for success. You have been my biggest cheerleaders and been in the front row for concerts in my nineteen years of teaching. Your support means the world to me.

I would also like to thank my amazing and talented students at Maria Montessori and all the previous schools where I have taught. You are the real reason I love going to work every day and without you, I couldn't do what I love. I am grateful for your energy and enthusiasm, curiosity, creative ideas, and the fun you bring to my classroom.

My gratitude goes out to my wonderful colleagues both in the RPS music department in my district and at Maria Montessori. I have gained invaluable knowledge and experiences from each of you and would not succeed in my endeavors without your support. I am also indebted to

the wonderful musicians I work with outside of school who have inspired me to become a better musician and performer. You have kept my passion for music burning.

Thank you to my friends who have encouraged me along the way, whether by giving me ideas, understanding that sometimes I've been busy writing, or just cheering me on and believing in me. Jen and Rachel, thank you for your daily support throughout this process and through life. Thank you to my person, Peter. Your support and belief in me have been unwavering since I started this dissertation. I know that will not change and will translate into our other endeavors. I could not have asked for a stronger rock through this process.

Finally, I am indebted to my advisor, Dr. Nathan Street. I am fortunate for having received a wealth of knowledge he shares with his students, his encouragement and high expectations, willingness to go the extra mile to ensure his students' understanding, and confidence in my abilities. Thank you also to my reader, Dr. Monica Taylor, for your expertise and time, and to all the knowledgeable professors and colleagues whose support I have experienced in multiple ways throughout this journey.

Contents

List of Tables and Figures

List of Abbreviations

DI – Differentiated Instruction

IMI – Intrinsic Motivation Inventory

MMS – Maria Montessori School

PMM – Participatory Music Making

RPS – Rockford Public Schools

SDT – Self-Determination Theory

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this causal-comparative study is to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele through different curricula in the music classroom as measured by the Intrinsic Motivation Inventory (IMI).[1] While music teachers may employ techniques that they believe are motivating their students, students can serve as a more accurate source of their motivation levels. The research was conducted by having half the student population learn the ukulele through a traditional curriculum, and half the students learn the ukulele through a popular music curriculum. The researcher then surveyed students regarding their motivation levels. This opening chapter provides a background on the implementation of the ukulele in the music classroom, the issue that informed the need for this study, and an explanation of how this study can contribute to the body of literature on teaching the ukulele. This chapter will explain how this study could provide insight to others in the music community and the theoretical framework on which it is based. Finally, the chapter's conclusion will define terms applied throughout the study.

[1] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

Background

Historical

The ukulele is a fretted string instrument that has gained popularity for implementation in the general music classroom.[2] Music educators choose the ukulele for several reasons. The ukulele is affordable, portable, and versatile in the music classroom. Students can experience success early on when playing the ukulele by learning just one chord to accompany themselves as they sing or play along with a popular, familiar song. As the ukulele has gained momentum, music educators have utilized various resources, including books, online curricula, and YouTube videos and channels. The ukulele also allows students to feel welcomed, experience a positive atmosphere while playing, and actively engage in learning. Researchers who have studied community ukulele ensembles noted the support and safe, non-judgmental environment members share when playing in a ukulele group.[3] Despite these potential benefits of teaching the ukulele and the various available resources, research on this topic lacks substance as the students' opinions regarding music selection have not been considered. Grace Doebler suggested that students' opinions about the ukulele be included in future research.[4] This study compared students' motivation levels after learning the ukulele using either traditional curriculum or popular music curriculum.

---

[2] Webb et al., "Ukulele Surge: Finally Some Respect?" *Musical Merchandise Review* 168, no. 10 (2009): 48.

[3] Jill Alyse Reese, "Uke, Flow, and Rock 'n' Roll," *International Journal of Community Music* 12, no. 2 (2019): 214.

[4] Grace Doebler, "Ukulele in Music Class: Teachers' Perspectives," *Visions of Research in Music Education* 38, no. 2 (2021): 3.

The topic of student motivation has been studied by many researchers in different ways. Hadjikou concluded that student motivation has declined, partly because students believe that their school music education is irrelevant to their daily lives outside of school and they therefore do not enjoy it.[5] She also stated that there is a need for further research on the topic of motivation, especially when incorporating a new music curriculum in the classroom.[6] Chi Wai Chen also found that students experience significant motivation increases when engaged with tablets and popular music in the classroom.[7] Due to the popularity of the ukulele and the importance of understanding student motivation while experiencing new curricula, this study helped fill an area of need that has not yet been fully investigated.

Many educators and researchers value a concept referred to as Differentiated Instruction (DI). The purpose of DI is to allow teachers to address many different learning styles and abilities within the same classroom.[8] Through DI, students are also allowed more choice over their learning and, thus, more ownership. Teachers have differentiated in several ways. One way is to differentiate the material students are learning. They can utilize various materials students are expected to master based on their abilities. They can also differentiate through the process of student learning. Educators can differentiate the process by teaching the same concept in multiple ways for learners at various levels and visual, kinesthetic, and aural learners. Finally, teachers can differentiate the final product on which they assess students. Allowing students to

[5] Chryso Hadjikou, "Students' Motivation to Engage in Music Lessons: The Cypriot Context," *Research Studies in Music Education* 44, no. 2 (2022): 413.

[6] Ibid., 428.

[7] Jason Chi Wai Chen, "Mobile Composing: Professional Practices and Impact on Students' Motivation in Popular Music," *International Journal of Music Education* 38, no. 1 (2020): 147.

[8] Amy Benjamin, *Differentiated Instruction: A Guide for Elementary School Teachers* (New York: Routledge, 2013), 1.

choose from a menu of options to demonstrate their learning is an example of using DI for students' final product.[9]

While differentiating instruction is not new, applying it to the music classroom warrants further research. Bernard and Cayari believe that some available ukulele resources are only tailored to high-level learners and that more DI is needed to assist average learners and learners needing extra help.[10] They suggest that music teachers should spend more time planning to differentiate instruction to benefit all classroom learners.[11] While they highlight a few ways for teachers to differentiate ukulele instruction, they also state that the success of their techniques has not been thoroughly researched.[12] This study employed various differentiation techniques to best help the students regardless of whether they learned traditional ukulele curriculum or popular music curriculum.

Another area of research interest is multi-age classrooms. Italian teacher Maria Montessori began utilizing multi-age classrooms over one hundred years ago to support her beliefs of how children learn best.[13] Although a limited number of schools implement multi-age classrooms, most educators teach students with various abilities and skill levels in their classrooms. While some music educators have attempted to explore Montessori's method in their music classrooms through centers, more research is needed to determine how to effectively

---

[9] Stephanie L. Standerfer, "Differentiation in the Music Classroom," *Music Educators Journal* 97, no. 4 (2011): 43.

[10] Cara Faith Bernard and Christopher Cayari, "Encouraging Participatory Music Making Through Differentiation on the Ukulele," *General Music Today* 34, no. 1 (2020): 30.

[11] Ibid.

[12] Ibid., 33.

[13] Maureen Harris, "The Effects of Music Instruction on Learning in the Montessori Classroom," *Montessori Life* 20, no. 3 (2008): 26.

instruct multi-age learners or learners of various ability levels. This study was conducted with multi-age learners, grades four through six, working in the same classroom. Research gained in this way could provide insight to educators working with students of various ability levels in their classes.

A topic of great interest within ukulele instruction is teaching popular music more informally. Several authors have offered the term Participatory Music Making (PMM), which engages all students in music learning regardless of their current ability level.[14] One way of instructing students on the ukulele is through informal music learning, where the students assume more leadership of their education, and the teacher assumes the facilitator rather than an instructor role. In this model, students collaborate and learn from each other.[15] While researchers have studied informal learning, studies involving the ukulele are still needed. This research incorporated informal learning while students played the ukulele.

Another aspect of learning the ukulele that is vital to the study is that students can perform popular music or music with which they are familiar. Research supports popular music instruction to motivate students and increase engagement.[16] More research is warranted on the topic of informally teaching popular music on the ukulele. While music educators support including more modern instruments and popular music in their classrooms, they have overwhelmingly expressed the need for more ukulele and other more modern instrument training

[14] Bernard and Cayari, "Encouraging Participatory Music Making Through Differentiation on the Ukulele," 29.

[15] Lucy Green, "The Music Curriculum as Lived Experience: Children's "Natural" Music-Learning Processes," *Music Educators Journal* 91, no. 4 (2005): 28.

[16] Seth Pendergast and Nicole R. Robinson, "Secondary Students' Preferences for Various Learning Conditions and Music Courses: A Comparison of School Music, Out-of-School Music, and Nonmusic Participants," *Journal of Research in Music Education* 68, no. 3 (2020): 266.

and pedagogies.[17] Central to the study is the idea of student motivation. Participants in various ukulele groups express joy or fun as part of their emotions when they learn the ukulele.[18] By experiencing these emotions, students may be motivated to continue learning the instrument. Studies comparing student motivation levels on the ukulele while learning various music have not been completed and warrant further study.

Along with the ukulele's popularity, the study of differentiating instruction, multi-age classrooms, informal learning, and motivation levels have all trended within education and more specifically, the general music classroom. While some of these concepts have been researched, further research on student motivation levels is necessary. This study provided insight by including students' feedback on their motivation levels, whether in the group that receives traditional ukulele instruction or popular music instruction. The findings are informational for other music teachers via online platforms and live presentations.

Sociological

The researcher taught a six-week ukulele unit to students at her school and compared students' motivation levels while learning traditional ukulele curriculum versus popular music curriculum. Popular music can be defined by its mass production, high consumption, appeal to the masses, and strong social influence.[19] Many ukulele players state that their reasons for wanting to play the ukulele are not only musical achievements but because they gain a sense of

[17] Jennifer Blackwell, Nicholas Matherne, and Cathlyn Momohara-Ho, "Preservice Music Teachers Perceptions of Teaching and Learning Popular Music," *Journal of Music Teacher Education* 31, no. 3 (2022): 51.

[18] Raychl Smith and Jacqueline Secoy, "Exploring the Music Identity Development of Elementary Education Majors Using Ukulele and YouTube," *Journal of Music Teacher Education* 29, no. 1 (2019): 78.

[19] D. Gregory Springer, "Teaching Popular Music: Investigating Music Educators' Perceptions and Preparation," *International Journal of Music Education* 34, no. 4 (2016): 404.

belonging and community.[20] Participants in several community ukulele groups shared that, during their playing sessions, they experienced feelings of belonging and enjoyed a non-judgmental atmosphere.[21] Other members described their joy and energy while performing in ukulele groups. These feelings of community and social bonding emerge in other music ensembles too, such as choirs and bands where members have chosen to participate.[22] Adult musical groups with voluntary membership have also shown connectedness and belonging as emerging themes from members.[23]

Another positive aspect of group ukulele playing was the combination of players with various ability levels helping and encouraging one another.[24] When a ukulele ensemble chooses their music, they also better understand other players' musical tastes and get to know them.[25] Since students can play and sing on the ukulele simultaneously, this makes it a better choice for performing familiar, popular music than other general music instruments such as the recorder.

The researcher attempted to utilize these positive qualities found in community ukulele ensembles within the general music classroom. Many of the same characteristics existed – students of various ability levels and ages, unique musical preferences, and individual learning styles. However, in schools with general music classes, usually all students are enrolled in the

---

[20] Nathan B. Kruse, "'Without U, it's Just Kulele': Expressions of Leisure and 'Ohana in an Intergenerational Ukulele Club," *International Journal of Community Music* 6, no. 2 (2013): 158.

[21] Ibid.

[22] Cynthia Jacob, Christine Guptill, and Thelma Sumsion, "Motivation for Continuing Involvement in a Leisure-Based Choir: The Lived Experiences of University Choir Members," *Journal of Occupational Science* 16, no. 3 (2009): 187.

[23] Ann M. Harrington, "Aspects of Ensemble Participation and Feelings of Belonging Among New Horizons Members," *Contributions to Music Education* 46 (2021): 20.

[24] Reese, "Uke, Flow, and Rock 'n' Roll," 217.

[25] Matthew D. Thibeault and Julianne Evoy, "Building Your Own Musical Community: How YouTube, Miley Cyrus, and the Ukulele Can Create a New Kind of Ensemble," *General Music Today* 24, no. 3 (2011): 47-48.

class; it is not an elective. Since all students' attendance in music class is mandatory and all students within given grades were included in this research, the motivation and enjoyment levels could differ from those in ensembles who have chosen to join.

Theoretical

A combination of two intertwined theoretical frameworks guided this study. The first of these was Self-Determination Theory (SDT), developed by Richard M. Ryan and Edward L. Deci starting in 1985.[26] SDT primarily studies three human psychological needs that comprise motivation – competence, relatedness, and autonomy.[27] SDT seeks to investigate how various human interactions and social situations converge to facilitate motivation.[28] SDT can be applied in schools to examine student motivation. Ryan and Deci suggest that children are naturally intrinsically motivated, and many schools fail to capitalize on that knowledge.[29] They suggest that student success should comprise more than just achievement academically but should also include them flourishing as individuals as they grow into diverse adults.[30]

Various educators and researchers have applied SDT to their studies. Oliveira et al. applied SDT when examining motivation as a predictor of student achievement in music.[31] They described the continuum of motivation from amotivated to intrinsically motivated. In

[26] Richard M. Ryan and Edward L. Deci, *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness* (New York: The Guilford Press, 2017), vii.

[27] Ibid., 3.

[28] Ibid., 6.

[29] Ibid., 351.

[30] Ibid.

[31] António Oliveira et al., "Can Motivation and Intentions of Parental Support Predict Musical Achievement Before the Commencement of Musical Studies at the Elementary School Level?" *International Journal of Music Education* 42, no. 1 (2023): 1.

amotivation, a person's needs are not met. An intrinsically motivated person has highly satisfied needs.[32] They recognized that the level of the students' motivation affected the student's overall effort and outcome.[33]

Wong et al. applied SDT when examining motivation in students who had experienced differentiated instruction based on their personal interests.[34] Through their study, they determined that students who participated in differentiated instruction lessons showed increased motivation levels.[35] As Ryan and Deci suggested in SDT, the participants in Wong et al.'s study may have shown greater motivation levels through differentiated instruction as their basic psychological needs were being met.[36] Wong et al. also acknowledged that their study is one step in investigating student motivation and suggested that future studies be conducted to further investigate.[37]

Schatt utilized SDT while studying students' motivation to practice their instrument.[38] In his study, he examined levels of self-determination in high school band students regarding their motivation levels to practice. He found that participants in his study produced higher scores of intrinsic motivation than extrinsic motivation, but also ranked highly in amotivation.[39] He noted

---

[32] Oliveira et al., "Can Motivation and Intentions of Parental Support Predict Musical Achievement," 4.

[33] Ibid.

[34] Bing Sum Wong et al., "Differentiated Instruction: A Comparison of Motivation and Perceived Competence Between Students with High and Low Readiness Levels," *Educational Research for Policy and Practice* 22, no. 1 (2022): 143.

[35] Ibid., 147.

[36] Ibid.

[37] Ibid., 150.

[38] Matthew D. Schatt, "The Music Practice Motivation Scale: An Exploration of Secondary Instrumental Music Students' Motivation to Practice," *International Journal of Music Education* 41, no. 1 (2023): 157.

[39] Ibid., 162.

that intrinsic motivation is the ultimate goal that music educators maintain for their students and suggests future studies that explore student autonomy and motivation.[40]

Woody acknowledged that music educators depend on student motivation for their success and studied motivation in his participants using SDT.[41] Four considerations to motivation in his study are student autonomy, social connections, active participation, and musical preferences. Enjoyment has also been correlated with student motivation.[42] In his study, he specifically concluded that learning happening with student autonomy resulted in a higher degree of intrinsic motivation. Other conditions that resulted in very high levels of intrinsic motivation were social connections, achievement, and enjoyment.[43] His findings on social connections, autonomy, and musical preferences not only connect to SDT but also relate to the constructivist theory.

Swedish philosopher Jean Piaget created the Constructivist Theory, which is the second theory that guided the study of teaching different ways of learning and differentiation on the ukulele.[44] Constructivist principles include the following: knowledge builds upon other knowledge; students learn how to learn; students learn through an active sensory process; students learn in social settings; students learn new information by connecting it to existing

---

[40] Schatt, "The Music Practice Motivation Scale," 169.

[41] Robert H. Woody, "Music Education Students' Intrinsic and Extrinsic Motivation: A Quantitative Analysis of Personal Narratives," *Psychology of Music* 49, no. 5 (2021): 1321.

[42] Ibid., 1328.

[43] Ibid., 1334.

[44] "Piaget's Theory of Constructivism," Teach-Nology, accessed June 1, 2023, https://www.teach-nology.com/currenttrends/constructivism/piaget/#:~:text=Piaget's%20theory%20of%20constructivism%20argues,teaching%20methods%2C%20and%20education%20reform.

information; students must engage their minds; and students require motivation to learn.[45] Piaget believed that interaction with his or her environment was the key to student learning, and that children do not learn best from rigid, teacher-centered, structured lessons.[46] He believed a key to motivation was children understanding their potential.[47]

Lev Vygotsky addressed the need for collaboration in learning, and developed social constructivism.[48] Social constructivism can be experienced in the classroom as students and teachers share knowledge and authority, students learn in small cooperative groups, and the teacher assumes the role of a facilitator rather than a full-group instructor.[49] An essential part of Vygotsky's belief is that people and social circumstances influence children and their knowledge.[50] When applied together, Constructivism and SDT overlap in many ways and can be a lens through which to examine classroom practices.[51]

Music educators have successfully applied constructivism to their teaching environments. Understanding the human learning process is an important step for educators to facilitate

---

[45] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[46] Cecelia Schmitt, "The Thought-Life of Young Child: Jean Piaget and the Teaching of Music," *Music Educators Journal* 58, no. 4 (1971): 24.

[47] Ibid., 25.

[48] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[49] Ibid.

[50] Luke Gray, "Constructivist Approaches in the Music Classroom: The Orff Schulwerk Approach as a Student Centered Constructivist Pedagogy," *Musicworks: Journal of the Australian Council of Orff Schulwerk* 23 (2018): 9.

[51] Joseph Shively, "Constructivism in Music Education," *Arts Education Policy Review* 116, no. 3 (2015): 129.

productive classrooms.[52] Many educators, including Luke Gray, implement the Orff Schulwerk approach to teaching music, which utilizes a partnership between students and teachers and guided exploration by the students, two of the critical features of constructivism.[53] Gray also implements differentiated instruction to tailor instruction to a variety of learners.[54] John Barron applies what is known as Vygotsky's "zone of proximal development,"[55] better understood as the place where the learning occurs. Barron, in doing this, identifies where he would like his widely varied jazz band students to progress to from their current level. Through students' natural interactions and informal learning in a jazz band setting, Barron believes they learn to construct their own knowledge.[56]

Many music educators utilize hands-on learning in their classrooms. Donna Hewitt applies constructivism through informal learning. She believes that hands-on discovery and open-ended questions are key to having students experience learning.[57] Kladder also believes hands-on experiences lead students to knowledge, and utilizes a modern band approach where students take leadership of their learning by interacting and collaborating with one another.[58] Kamii and Ewing reinforce the importance of play as a form of learning. They apply Vygotsky's

---

[52] Jackie Wiggins, "Constructivism, Policy, and Arts Education," *Arts Education Policy Review* 116, no. 3 (2015): 115.

[53] Gray, "Constructivist Approaches in the Music Classroom," 10.

[54] Ibid., 11.

[55] John Barron, "Lessons from the Bandstand: Using Jazz as a Model for a Constructivist Approach to Music Education," *Music Educators Journal* 94, no. 2 (2007): 19.

[56] Ibid., 20.

[57] Donna Hewitt, "Constructing Informal Experiences in the Elementary General Music Classroom," *Music Educators Journal* 104, no. 3 (2018): 46.

[58] Jonathan Kladder, "Songwriting in Modern Band?: Considering Constructivism as an Approach for Teaching Popular Music," *College Music Symposium* 60, no. 2 (2020): 8-9.

idea that learning begins with the child."[59] The application of SDT and Constructivism guided this study.

Problem Statement

A literature review involving teaching the ukulele, multi-age classrooms, differentiation, Maria Montessori, and motivation levels revealed gaps in information that showed the need for this study. While each of these topics has been examined, and music teachers support the ukulele's application in the general music classroom, more work is needed to inform teacher professional development on students' motivation levels on the ukulele. Understanding if there is a difference in motivation levels between students learning traditional ukulele curriculum and popular music curriculum can shape teachers' instrument pedagogy.

Music educators have identified many benefits of playing the ukulele. Musical skills include concepts such as playing chords and melodies while also singing.[60] Non-musical benefits include the idea of participation and feeling welcomed into a community.[61] An issue that has not been fully addressed is if student motivation levels differ when learning via different curricula on the ukulele. The most significant issue that created a need for this study is that students' perspectives and opinions, thus far, have not been included in research about the ukulele.[62]

---

[59] Constance Kamii and Janice K. Ewing, "Basing Teaching on Piaget's Constructivism," *Childhood Education* 72, no. 5 (1996): 260.

[60] Robin Giebelhausen, "So, You're Thinking About Starting a Ukulele Program?" *General Music Today* 29, no. 3 (2016): 38.

[61] Kruse, "'Without U, it's Just Kulele,'" 158.

[62] Doebler, "Ukulele in Music Class," 21.

Music researchers have studied the disconnect students perceive between the music they learn at school and the music they listen to and learn at home.[63] This information led to further study of teaching the ukulele in the classroom, which can bring together music skills while also allowing students to play music with which they are familiar and invested. While much of the music played on the ukulele is popular and can be learned informally, many music education undergraduate programs contain very little information on how to teach this way.[64] The problem is that the literature has not addressed students' opinions on their motivation levels for learning the ukulele via traditional curriculum versus popular music curriculum.

Purpose Statement

The purpose of this causal-comparative study is to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele via different curricula in the music classroom. The independent variable was the popular music instruction that half the students received. Participants included 175 fourth-through sixth-grade students in multi-age classes in their general music classroom in a public Maria Montessori School in Rockford, IL. The researcher taught half the students using traditional ukulele curriculum and half using popular music curriculum. She then surveyed the students regarding their total motivation levels plus four subcategories. The dependent variables were the resulting motivation levels.

---

[63] John Kratus, "Music Education at the Tipping Point," *Music Educators Journal* 94, no. 2 (2007): 44.

[64] Jui-Ching Wang and Jere T. Humphreys, "Multicultural and Popular Music Content in an American Music Teacher Education Program," *International Journal of Music Education* 27, no. 1 (2009): 26.

Significance of the Study

The findings from this study will be applied to further ukulele instruction in the general music classroom or for private ukulele instructors. Per the self-determination theory, the results from this study investigated students' motivation. Per the constructivist theory perspective, the results from this study helped determine how students make meaning from their new knowledge, connect it to prior knowledge, and experience motivation to continue learning. Both of these theories guided this study.

The literature showed that studies on the topics of ukulele, differentiation, multi-age classrooms, and informal learning have not been conducted in conjunction, and further studies are warranted to gain students' perspectives on motivation while combining these concepts. While research has shown the benefits of playing the ukulele, studies on students' motivation levels have not been investigated. The results can provide music teachers insight into how to improve their ukulele instruction by examining motivation levels and fill a current gap in the literature.

General music teachers may access the study to gain insight on students' motivation levels. They may choose to incorporate traditional or popular music curriculum based on the study results. The students' survey results highlighted whether there was a difference in motivation levels between students learning the ukulele via traditional ukulele curriculum and those learning via popular music curriculum. This information can serve classroom music teachers, and they can implement the results to tailor their classrooms in a way that will highly encourage their students. Music teachers could witness more productive classrooms and fewer classroom management and behavior issues.

Research Questions

Central Research Question (RQ1)

Is there a difference in student motivation between fourth through sixth-grade students who learn the ukulele through traditional curriculum and those who learn the ukulele through popular music curriculum?

Definitions

The following terms and definitions are used in this study and found in the literature related to this study.

1. *Constructivist theory* – the idea that learners construct their knowledge based on their experiences and tie it to prior knowledge.[65]
2. *Differentiated Instruction* (DI) – using "a variety of classroom practices that allow for differences in students' learning styles, interests, prior knowledge, socialization needs, and comfort zones."[66]
3. *Informal learning* – the participants learn by experience; it is peer-directed and hands-on.[67]
4. *Maria Montessori* – founded by Dr. Maria Montessori, who was an innovative Italian educator and who believed that education should be child-centered and developed

[65] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[66] Benjamin, *Differentiated Instruction*, 1.

[67] Green, "The Music Curriculum as Lived Experience," 28.

methods, such as multi-age learning groups, that are still being implemented over a hundred years later.[68]

5. *Multi-age classroom* – classrooms contain students from various grade levels and ages.
6. *Participatory Music Making* (PMM) – participants experience hands-on learning where everyone makes music, regardless of their skill level.[69]
7. *Popular Music* – music categorized by its mass production, high consumption, appeal to the masses, and strong social influence.[70]
8. *Social constructivism* – a more specific type of constructivist theory coined by Lev Vygotsky that addresses the need for collaboration in learning.[71]
9. *Self-determination theory* (SDT) – a theory based on human behavior; it is concerned with the conditions that help facilitate motivation.[72]

Summary

The ukulele has gained in popularity as a pedagogical instrument in general music during the last ten years in music education. Although some studies have been conducted for researchers to ascertain the best practice in teaching the ukulele, research based on student motivation is lacking. Students often come to general music classes with various ability levels, music backgrounds, and in some cases, in multi-age groups. The effective educator must know how to

[68] "American Montessori Society," accessed April 25, 2023, https://amshq.org/About-Montessori/History-of-Montessori/Who-Was-Maria-Montessori.

[69] Bernard and Cayari, "Encouraging Participatory Music Making," 29.

[70] Springer, "Teaching Popular Music," 404.

[71] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[72] Ryan and Deci, *Self-Determination Theory*, 3.

motivate students to help them progress and reach their potential. By comparing two groups of students, the researcher gained data on whether learning traditional ukulele curriculum or popular music curriculum was more motivational.

CHAPTER TWO: REVIEW OF THE LITERATURE

Overview

The purpose of this study is to examine students' motivation after experiencing learning the ukulele in the multi-age general music classroom. The ukulele has become a mainstay in the general music classroom due to its cost, portability, and versatility.[73] Elementary school students come to music class with various ability levels.[74] They benefit while playing the ukulele through many formal and informal learning experiences. Many music educators note the need for more continuity between the music that students listen to outside of school and their music classes in school.[75] Pre-service and current music educators state that teaching popular music to relate to students benefits them and their learning environments. Unfortunately, most of them need preparation to teach informally or use popular music, and they require more field experience to feel comfortable.[76] Teachers listed the following reasons for not including popular music in their classroom: they did not have enough background to feel comfortable; they did not have appropriate resources; and they did not initially value popular music.[77]

Researchers can track which strategies and methods result in the greatest student motivation and success while employing those various techniques. Researchers can also survey students' motivation levels while completing various activities on the ukulele to determine which

---

[73] Dave Brandl and Bill Croke, "There's a Uke in My Class," *Montessori Life* (2021): 42.

[74] Alice-Ann Darrow, "Differentiated Instruction for Students with Disabilities: Using DI in the Music Classroom," *General Music Today* 28, no. 2 (2015): 19.

[75] Springer, "Teaching Popular Music," 403.

[76] Blackwell, Matherne, and Momohara-Ho, "Preservice Music Teachers Perceptions of Teaching and Learning Popular Music," 49.

[77] Sharon G. Davis and Deborah V. Blair, "Popular Music in American Teacher Education: A Glimpse Into a Secondary Methods Course," *International Journal of Music Education* 29, no. 2 (2011): 128.

differentiation techniques and teaching styles appealed to them the most. This literature review reveals the information researchers have already conducted on the ukulele, motivation, differentiation, Maria Montessori and multi-age classrooms, and participation in informal learning and popular music.

Self-Determination Theory and Constructivism Framework in the Music Classroom

Two theories that overlap and possess many of the same characteristics guided this study. The first of those theories is Self-Determination theory (SDT), which was developed by Richard M. Ryan and Edward L. Deci, originally in 1985.[78] SDT focuses on the conditions that encourage or discourage people to flourish.[79] This theory posits that the three areas of autonomy, relatedness, and competence must be satisfied in order for people to experience wellbeing.[80] SDT also suggests that children are especially motivated to assimilate and learn new information when it is meaningful to them.[81]

Researchers have used SDT as a guiding theory in studies on motivation. Comeau et al. studied adolescent students' motivation levels while learning instruments and applied SDT.[82] While using SDT, they measured not only the level of their students' motivation, but the specific

[78] Ryan and Deci, *Self-Determination Theory*, vii.

[79] Ibid., 3.

[80] Paul Evans and Arielle Bonneville-Roussy, "Self-Determined Motivation for Practice in University Music Students," *Psychology of Music* 44, no. 5 (2016): 1095.

[81] Ryan and Deci, *Self-Determination Theory*, 351.

[82] Gilles Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire: Assessing Children's and Adolescents' Autonomous Motivation for Learning a Musical Instrument," *Motivation and Emotion* 43, no. 5 (2019): 706.

type of motivation – internal, external, or amotivated.[83] Evans and Bonneville-Roussy also applied SDT while studying university students' motivation to practice. They sought correlations between high motivation levels and high levels of the psychological needs discussed in the SDT.[84]

The second theory applied in this study was the constructivist theory. Guiding constructivist principles in this study included students using an active sensory process, students learning in social settings, students engaging their minds, and students feeling a sense of motivation in order to learn.[85] Psychologist Jean Piaget posited that children interacting with their environment was essential to their learning.[86] Piaget also believed children learn through action and do not learn best from highly structured, teacher-centered lessons.[87] He also thought that children must see the potential in their learning to be motivated.[88] Similarly, Lev Vygotsky later coined social constructivism, explicitly addressing the need for collaboration in education.[89] Social constructivism applies to the classroom as students and teachers must share knowledge, students and teachers must share authority, teachers guide students, and students learn in small groups.[90] Vygotsky believed that children are influenced by their surroundings, so the people and

---

[83] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 706.

[84] Evans and Bonneville-Roussy, "Self-Determined Motivation for Practice in University Music Students," 1105.

[85] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[86] Schmitt, "The Thought-Life of Young Child," 24.

[87] Ibid.

[88] Ibid., 25.

[89] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[90] Ibid.

social circumstances around them contribute to their knowledge.[91] Constructivism can be considered a lens to examine classroom practices, not an actual learning method.[92]

Music educators can apply constructivism to their classroom teaching in various ways. When teachers understand the human learning process, using a constructivist mindset to inform classroom teaching can be highly productive.[93] Gray uses the Orff Schulwerk approach to teach music and points out how constructivism naturally fits in. The Orff approach utilizes a partnership between students and teachers and guided exploration by the students, two of the critical features of constructivism.[94] Gray also uses differentiation to assist students with various needs and balances different pedagogical approaches to best reach students.[95] Barron utilizes constructivism by teaching jazz band to musicians of widely ranging abilities. He identifies where his students are with their musicianship and where he would like them to progress.[96] Vygotsky identifies this process as the "zone of proximal development,"[97] where learning occurs. Barron believes that through their naturally occurring experiences in the jazz band, students learn through interaction and construct their knowledge.[98]

---

[91]Gray, "Constructivist Approaches in the Music Classroom," 9.

[92] Shively, "Constructivism in Music Education," 129.

[93] Wiggins, "Constructivism, Policy, and Arts Education," 115.

[94] Gray, "Constructivist Approaches in the Music Classroom," 10.

[95] Ibid., 11.

[96] Barron, "Lessons from the Bandstand," 19.

[97] Ibid.

[98] Ibid., 20.

Hewitt believes informal learning is a natural way to apply constructivism in the music classroom.[99] In her classroom observations, she observed a music educator, Ms. Ruiz, challenging her students to learn by ear. Ruiz also used musical puzzles where the students actively engaged with others and their environment to construct new knowledge.[100] Hewitt believes that instead of giving the students a question requiring a specific answer, constructivist teachers provide them opportunities to own their learning through hands-on discovery.[101]

Kladder writes about the mix of approaches teachers can utilize in a music classroom.[102] He discusses constructivism and its application when students lead their education process. He uses a modern band classroom to apply these principles of constructivism. He includes social interaction and collaboration elements to help his students learn and take ownership.[103] His students develop their new knowledge through action rather than passively receiving knowledge from the teacher.

Kamii and Ewing write about constructivism as the belief that learning originates inside the child.[104] This idea correlates with Vygotsky's thoughts that play is integral to a child's development.[105] Kamii and Ewing write about Piaget's assertation that children need a framework to construct knowledge.[106] In the music classroom, for example, the teacher gives

---

[99] Hewitt, "Constructing Informal Experiences in the Elementary General Music Classroom," 46.

[100] Ibid., 47.

[101] Ibid.

[102] Kladder, "Songwriting in Modern Band?" 10.

[103] Ibid., 8-9.

[104] Kamii and Ewing, "Basing Teaching," 260.

[105] L.S. Vygotsky, *Mind in Society: The Development of Higher Psychological Processes* (Cambridge, MA: Harvard University Press, 1978), 97.

[106] Kamii and Ewing, "Basing Teaching," 262.

guidance but allows the students to explore together and discover. Scott reinforces this idea by stating that part of teaching with a constructivist mindset enables students to explore ideas in a community setting.[107] She discusses student-centered approaches to the classroom that benefit the students and sees the curriculum as an avenue for students to learn, not the learning itself.[108] The experiences the students engage in while learning the material become the curriculum. Scott believes the best learning environment balances informal learning and teacher-directed learning.[109]

Application to Research

The researcher applied SDT to this study by examining student motivation. She used the key element of human interaction as she taught her students the ukulele and facilitated them working together in small groups. She also looked through the constructivist lens by studying how a ukulele can enhance student learning through various formal and informal learning experiences. With this knowledge, the researcher examined how students construct knowledge through social interactions with their peers, self-discovery, and meaning-making. The teacher provided the basic framework for students to build and connect their new knowledge as they learned different techniques on the ukulele, and examined their motivation levels.

---

[107] Sheila Scott, "Contemplating a Constructivist Stance for Active Learning within Music Education," *Arts Education Policy Review* 112, no. 4 (2011): 191.

[108] Ibid., 192.

[109] Ibid., 194.

The Ukulele in the General Music Classroom

Support for the Ukulele in General Music

The ukulele is a unique instrument that has risen in sales worldwide and popularity for use in the general music classroom.[110] As a member of the string family, it contains frets and four strings.[111] Many people equate the ukulele to music from Hawaii, but it originated from Portuguese immigrants.[112] The soprano ukulele is tuned to G4, C4, E4, A5, in a tuning known as reentrant tuning, where the strings do not go directly from high to low.[113] In the last ten years, music teachers have increasingly chosen the ukulele for the general music classroom curriculum due to its versatility.[114] Teachers have noticed many advantages of incorporating the ukulele into their lessons. They can meet many music standards and teach various concepts using the ukulele. Students can play both harmony and melody on the ukulele.[115] Ukulele players can also accompany themselves while they sing.[116] Beginners can perform various rhythms on the ukulele through its many available strumming patterns.[117] Students can choose music from multiple genres on the ukulele to suit their tastes.[118] Also, many famous songs, such as Iz's version of

---

[110] Webb et al., "Ukulele Surge: Finally Some Respect?" 48.

[111] Philip Tamberino, *Uke Can Do It!: Developing Your School Ukulele Program* (Lanham, MD: Rowman & Littlefield 2014), 3.

[112] Ibid., 5.

[113] Giebelhausen, "So, You're Thinking About Starting a Ukulele Program?" 38.

[114] Ibid.

[115] Ibid.

[116] Ibid.

[117] Tamberino, *Uke Can Do It*, 77.

[118] Giebelhausen, "So, You're Thinking About Starting a Ukulele Program?" 38.

Somewhere Over the Rainbow/What a Wonderful World, are widely recognized, helping students form a personal connection to the instrument.[119]

Many other positive attributes of the ukulele contribute to its popularity, such as its low cost. Music teachers can purchase ukuleles for as little as $15, making classroom sets relatively affordable.[120] Some also come with a case, strap, or strings, so the player does not need to purchase anything additional to get started.[121] Their fretboards are smaller than a guitar, allowing student-sized hands to reach notes and chords effectively.[122] They are highly portable, have a unique sound, and are simple to play. Once students learn skills on the ukulele, they can transfer that knowledge to other instruments, such as the guitar.[123]

Over the last fifteen years, music educators have begun to question how they can reform the field of music education to be broader and make better connections with students.[124] Kordella Giotta began questioning her role as a band director, where she only taught students that chose to be in her ensembles and concluded that she wanted to teach in a classroom where she worked with all students. Through journaling and reflection, she decided to introduce the ukulele. She began to learn the instrument with her students and noticed many promising results. She observed a large amount of student engagement as they actively participated in learning the instrument while playing with YouTube tracks. Her students became passionate about the

---

[119] Tamberino, *Uke Can Do It*, 5.

[120] Marvin Greenberg, "The Ukulele in Your Classroom," *Music Educators Journal* 79, no. 3 (1992): 43.

[121] Adam Reeder, "The Best Ukulele," *Best Reviews* (2019): 3.

[122] Ibid.

[123] Brandl and Croke, "There's a Uke in my Class," 42.

[124] Kelsey Kordella Giotta, "Trading My Baton for a Ukulele," in *Narratives and Reflections in Music Education: Listening to Voices Seldom Heard*, ed. Tawnya D. Smith and Karin S. Hendricks (Cham, Switzerland: Springer, 2020): 65.

ukulele and pushed themselves to learn the instrument. She also noticed her own renewed interest in music, teaching, and performing. She reflected that the type of teaching she used with her students while teaching the ukulele was more inclusive and allowed for greater diversity.[125] As music educators look to add to their teaching repertoire, using the ukulele can be a great asset.

Doebler conducted a study to determine what positives teachers found when using the ukulele in the general music classroom.[126] Doebler points out that although the ukulele has increased in popularity, research regarding its use is lacking and dated.[127] The teachers in her study agreed that the ukulele was simple to learn and use, and they themselves found it fun. The teachers also named the benefits of flexibility and accessibility.[128] Participants also noted that their students became more independent musicians while learning the ukulele, gaining extra-musical skills such as motivation and confidence.[129] Doebler also points out that teachers provided the information for her research and that future research should utilize student voices regarding ukulele playing.[130]

Community Aspect of Playing the Ukulele

Many musicians refer to the sense of belonging and community they experienced while performing music on the ukulele in a group. Kruse worked with the Dallas Ukulele Headquarters

[125] Giotta, "Trading My Baton for a Ukulele," 74.

[126] Doebler, "Ukulele in Music Class," 1.

[127] Ibid., 3.

[128] Ibid., 15.

[129] Ibid., 18.

[130] Ibid., 21.

(DUH) group to determine the members' sense of identity. Although it was a specific community group he worked with rather than a music class in a school, members overwhelmingly shared their feelings of support and noted a positive atmosphere during rehearsals. The participants in this study also pointed out the benefits listed earlier, such as the portability and ease of playing the instrument. Finally, technology such as Facebook and iPads helped contribute to the members' feelings of community.[131]

Reese found similar results while studying a community ukulele group.[132] She learned what the participants feel while they are engaged in playing and how their experiences help define their musical identity. Reese, who also participated in the ukulele ensemble, found that during the jam sessions, participants discussed a safe and non-judgmental atmosphere and an environment that was accessible and welcoming.[133] Some of the group members made additional comments regarding the secure environment. One said that it was a safe place to make mistakes. Another participant said that it was simple to jump back into the music if you missed a few notes. Participants felt safe within the ensemble and were not judged for their mistakes or shortcomings.[134] The participants also thought that the atmosphere supported players at various levels. One member commented that a new ukulele player might have a few chords down even after one session, enabling them to play an entire song much sooner than on a traditional band instrument. Other study members noted that others within the group were helpful resources.

---

[131] Kruse, "'Without U, it's Just Kulele,'" 158.

[132] Reese, "Uke, Flow, and Rock 'n' Roll," 221.

[133] Ibid., 214.

[134] Ibid.

Finally, several group members described the concepts of energy and joy. The energy of the group playing together caused these positive feelings.[135]

Reese's study also revealed other positives. The members felt a sense of unity as they worked together toward a common purpose. They felt like real musicians and even rock stars while playing their ukuleles. Many also discussed memories of songs from their youth that they connected to again by learning them on the ukulele.[136] Reese concludes her study by encouraging future researchers to investigate these ideas in an educational context.

Thibeault and Evoy studied another ukulele group called the Homebrew Ukulele Union, whose members stated many positive outcomes.[137] Members in this ensemble build their instruments, write music, perform, and record. One group member commented that while choosing music to perform, she got to know her classmates better by learning their musical tastes. She also said that her favorite part of the group was not having to audition for it; everyone was welcome. The members had choice and ownership over the music they performed.[138] Finally, the author discussed that this ensemble type could help musicians become life-long learners.[139] The community aspect of playing ukulele in a group with other musicians of various ability levels creates camaraderie and a positive atmosphere.

---

[135] Reese, "Uke, Flow, and Rock 'n' Roll," 217.

[136] Ibid., 218-219.

[137] Thibeault and Evoy, "Building Your Own Musical Community," 44.

[138] Ibid., 47-48.

[139] Ibid., 50.

Available Curriculum and Resources

As the ukulele has gained popularity in the general music classroom, teachers and students can find many resources from which to draw. Some resources are part of sizeable general music curriculums such as *Quaver Music*.[140] Other publishers offer ukulele songbooks to supplement music curricula. Several ukulele players have YouTube channels featuring play-along videos or tutorials for learning the instrument or specific techniques.

Tomich created a ukulele curriculum called *Rainbow Ukulele*.[141] Her method uses color-coded dots on the ukulele to designate where the students place their fingers while playing specific chords. She claims that by color-coding the fretboards of the ukulele, she has cut her teaching time in half. Although she states teachers can adapt her curriculum as needed, she has written it specifically for fourth and fifth grade. Her curriculum uses C7, C, F, and G7 chords. Her book includes many practical suggestions, such as making an inexpensive strap for the ukulele and using buckets as chairs to sit on. To motivate students, she suggests colored beads they can earn by performing various skills on the ukulele. Students can then display the beads on a keychain or necklace. The *Rainbow Ukulele* method includes lesson plans with objectives and differentiation strategies. Tomich also has a website where teachers and students can access MP3 files of the songs in her curriculum.[142]

Hill and Doane created a ukulele guide called *You Can Play Ukulele Today*![143] They offer different options of starting with melodies or starting with chords. The chords used in this book

---

[140] "Quaver Music," accessed April 15, 2023, www.quavered.com.

[141] Shelley Tomich, *Rainbow Ukulele* (Pitch Publications, 2016), 2-6.

[142] Ibid.

[143] James Hill and J. Chalmers Doane, *You Can Play Ukulele Today*! (Brookfield, NS Canada: Crystal Lake Media, 2009): 3-16.

are C, C7, F, G, and G7. Their book uses traditional music notation and teaches music theory throughout. This book contains a total of ten lessons.

Another ukulele curriculum is available through *Quaver Music*.[144] *Quaver* is a web-based full music curriculum with a ukulele unit in the fifth-grade section. The curriculum includes introductory videos and play-along videos. Students learn to play on open strings, followed by a C scale, then chords C, F, and G7. *Quaver Music* includes traditional songs such *as Five Green and Speckled Frogs* and songs that were specifically written for *Quaver* including *Ukulele Shakee* and *The Crazy Alien Song*. *Quaver Music* also features a composing section called *QStrum*, where students can compose for their ukulele, hear it played, and play along with it. School districts that subscribe to *Quaver Music* would already have access to these resources.[145]

The *Music Will* website, formerly known as *Little Kids Rock*, features a free ukulele curriculum.[146] The lessons come in the form of videos by a ukulele expert. Teachers can follow all the videos in order or choose specific content for their students, such as chords, learning the pentatonic scale, or fingerpicking. A "Jam Zone" section also features play-along videos of many popular songs such as *Can't Stop the Feeling* by Justin Timberlake and *Shake it Off* by Taylor Swift. Teachers can search for songs by the number of chords or specific chords their students are learning. *Music Will* also offers visual supplements such as chord chart posters.[147] The same company also published a book called *Modern Band Method: Ukulele*, which features popular songs such as *Shout* by the Isley Brothers and *Uptown Funk* featuring Bruno Mars.

---

[144] "Quaver Music," accessed April 15, 2023, quavered.com.

[145] Ibid.

[146] "Music Will (Formerly known as Little Kids Rock)," accessed April 15, 2023, musicwill.org.

[147] Ibid.

Crawford writes about the importance of rethinking education in the modern world.[148] She concludes that technology in education should keep up with technology in the real world.[149] As such, YouTube channels have become prevalent for learning the ukulele. Aspiring ukulele players can visit and subscribe to these channels to hear songs played on the ukulele, watch video tutorials, and find play-along videos. One ukulele artist who has a popular YouTube channel is Cynthia Lin. Part of her channel advertises her songs and albums, but other parts contain videos to help beginning and intermediate ukulele players. Her strumming tutorial video has nearly four million views.[150] She also has tutorials on other ukulele concepts, such as changing chords. Finally, her play-along videos contain popular songs such as *Havana* and *Old Town Road*.[151]

Another ukulele YouTube channel with nearly 140,000 subscribers is the Ukulaliens Ukulele Club Channel.[152] This channel features various play-along videos for modern songs such as *Somewhere Over the Rainbow* by Iz and *Stand By Me* by Ben E. King. Other videos help students switch between two, three, or four chords as they prepare to learn songs. The videos are grouped by ability level.[153]

---

[148] Renée Crawford, "Rethinking Teaching and Learning Pedagogy for Education in the Twenty-First Century: Blended Learning in Music Education," *Music Education Research* 19, no. 2 (2017): 195.

[149] Ibid., 208.

[150] Cynthia Lin, "Cynthia Lin Music," accessed April 20, 2023, YouTube channel, www.youtube.com/cynthialinmusic.

[151] Ibid.

[152] Rachel Welby, "Ukulaliens Ukulele Club," accessed April 20, 2023, YouTube channel, www.youtube.com/@Ukulaliens/featured.

[153] Ibid.

O'Leary conducted a study on popular ukulele YouTube channels. He examined the types of videos, musical content, teaching strategies, and audience engagement.[154] Something unique O'Leary noticed was that YouTube is an area where both professional and amateur musicians come together to create music and learn.[155] While he found varying content among different channels, tutorial videos comprised the most significant percentage. He also noted that although some channels contained similar content, such as how to complete different strum patterns, the techniques for teaching and notation varied.[156] One significant takeaway from this study is how YouTube channels could support self-directed learning in the classroom.[157]

Tips and Pointers for Playing the Ukulele

Many ukulele enthusiasts and researchers have offered tips for teaching the ukulele in ways that most benefit students. Pino experienced frustration while teaching chords to her students.[158] She first began using color-coding on ukulele frets where each note within a chord was the same color and found that students were successful with that model but did not understand the chord's notes. She then switched to color-coding based on the note. This way, a chord would use several colors to represent each of its notes. She finds this system valuable because she and her students can transfer that information to other instruments with the same

[154] Emmett James O'Leary, "The Ukulele and YouTube: A Content Analysis of Seven Prominent YouTube Ukulele Channels," *Journal of Popular Music Education* 4, no. 2 (2020): 175.

[155] Ibid., 177.

[156] Ibid., 185.

[157] Ibid., 187.

[158] Dorothy Pino, "Color-Coding for Confident Chording," *School Band and Orchestra* 25, no. 5 (2022): 24.

color-coding system, such as Boomwhackers. Her students' confidence in playing chords and switching between instruments has motivated her to continue with color-coding.[159]

Other authors give specific information on sequences and modifications they use when teaching the ukulele. Giebelhausen suggests starting with one-chord songs that students can strum and sing simultaneously.[160] This way, students can experience instant success and enjoyment. They are motivated to learn a second chord when one chord becomes boring. Giebelhausen begins with C and F chords first, as they use one and two fingers, respectively. Other methods introduce G or G7 early on, but many students struggle because those chords use three fingers. Her sequence for introducing chords is C, C7, am, F, G, and G7.[161] She also offers a multitude of techniques to help struggling students. One of her tricks is called AirUke, where she has the students use their left hand to switch chords, but their right hand strums in the air so no sound is produced. While they do that, she plays the actual chords so her students can hear what they should eventually achieve. Another of her tips is to divide students into groups so each group is only responsible for one chord in a song, rather than switching back and forth. She also suggests play-along songs available online.[162]

Greenberg suggests similar beginning activities as Giebelhausen. He also acknowledges the importance of early success and starts his students with songs that only use a C chord and are already familiar to them. His initial chord sequence is C, F, C7, G7, and Bb. In fifth grade and above, he teaches additional chords. He bases his sequence on students' ability to play them and

---

[159] Pino, "Color-Coding for Confident Chording," 24.

[160] Giebelhausen, "So, You're Thinking About Starting a Ukulele Program?" 39.

[161] Ibid.

[162] Ibid., 38.

how frequently they appear in familiar songs.[163] Greenberg also uses a modified tablature form turned sideways to help students understand how to read the charts; he later incorporates traditional tablature.[164] Greenberg also offers ways to help students perform before they can quickly switch chords, much like Giebelhausen does. He suggests dividing the class into groups where one plays the chordal accompaniment, and another plays a melodic part or sings. He gives ear training ideas like having a group play for the class with a chordal error on purpose and seeing if the other students can detect the error.[165]

Motivation

Studying Motivation and its Importance to Music Educators

Student motivation is an essential topic of discussion and study for music educators and is imperative at all levels.[166] Comeau et al. write that making-music is an enrichment to children and people worldwide.[167] Music educators commonly seek to understand why some students are motivated to learn music while others are not.[168] While music educators widely realize and believe in the benefits of music education to their students, many lack the knowledge of how to best motivate them. Cogdill believes that research on motivation may be useful for music educators to help their students persevere and receive the benefits of music education.[169] She also

[163] Greenberg, "The Ukulele in Your Classroom," 45.

[164] Ibid., 46.

[165] Ibid., 47.

[166] Hadjikou, "Students' Motivation to Engage in Music Lessons," 413.

[167] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 705.

[168] Ibid., 706.

[169] Susan H. Cogdill, "Applying Research in Motivation and Learning to Music Education: What the Experts Say," *Update: Applications of Research in Music Education* 33, no. 2 (2015): 49.

states that students need to believe that an activity is valuable and that they can succeed at it for them to experience motivation to participate.[170] Finally, there are different factors that motivate people based on their age and differences in their development.[171] Understanding those patterns and differences could benefit music educators.

The study of motivation is especially critical to musicians. Evans et al. discuss the importance of motivation as it shapes other behaviors in a musician's life beyond just practicing music.[172] They acknowledge that motivation shapes behaviors and affects people's feelings about themselves, such as their sense of self and personal identity.[173] For musicians and music educators, understanding motivation is critical as musical skills require effort for many years to develop and hone.[174]

Correlations Between Motivation and Other Factors

Several researchers have found correlations between motivation and other positive attributes. Bernabé-Valero et al. studied the role of gratitude in motivation.[175] They found that effort, created by the presence of motivation, was a positive predictor of gratitude.[176] They also concluded that musical progress can be attained through both formal and untaught musical

[170] Cogdill, "Applying Research in Motivation and Learning to Music Education," 50.

[171] Ibid., 53.

[172] Evans et al., "Self-Determined Motivation for Practice in University Music Students," 1098.

[173] Ibid.

[174] Gloria Bernabé-Valero, José Salvador Blasco-Magraner, and Carmen Moret-Tatay, "Testing Motivational Theories in Music Education: The Role of Effort and Gratitude," *Frontiers in Behavioral Neuroscience* 13, no. 172 (2019): 1.

[175] Ibid., 7.

[176] Ibid.

training. [177] Woody found that when people maintain a high level of empowerment, direction, and leadership in an activity, their level of motivation is also higher.[178] Related to that, he also found that a lack of motivation occurs when students do not feel a sense of autonomy, and they often turn to more informal music making rather than continue in a formal music setting.[179] One of the components of the SDT, relatedness, is especially applicable in music, where people work together in community to learn and perform music.[180]

Comeau et al. found positive correlations between motivation and other factors in their study.[181] They found a high correlation between students who were committed to studying music and their levels of intrinsic motivation. They also noted that participants who experienced high levels of intrinsic motivation were linked to the student's persistence of optional musical activities.[182] Feraco et al. confirmed a positive correlation between motivation and self-regulated learning.[183] Building upon previous studies, they also found that motivation was a positive predictor of academic achievement in students in grades 5-12.[184] Mega et al. conducted a study where they examined the connection between motivation and other positive academic

[177] Bernabé-Valero et al., "Testing Motivational Theories in Music Education," 7.

[178] Woody, "Music Education Students' Intrinsic and Extrinsic Motivation," 1325.

[179] Ibid.

[180] Ibid., 1326.

[181] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 714.

[182] Ibid.

[183] Tommaso Feraco et al., "Soft Skills and Extracurricular Activities Sustain Motivation and Self-Regulated Learning at School," *The Journal of Experimental Education* 90, no. 3 (2022): 563.

[184] Ibid., 565.

attributes.[185] They found predictive links between motivation to academic achievement, self-regulated learning, and emotions.[186] The positive correlations between motivation and other desirable attributes further strengthen the importance of the study of motivation.

Studies on Motivation in Music

Researchers have studied motivation in music students using various methods and have found mixed conclusions. Hadjikou based her research on previous findings that students' motivation toward education had been declining and music in schools lacked relevance.[187] Further, the topics which students consider irrelevant to their lives cause them to have negative attitudes about learning.[188] She framed her study with Cognitive Evaluation Theory (CET), a subset of SDT, that focuses on intrinsic motivation and the idea that completing tasks where the person feels competent results in increased motivation.[189] The results of her study shows that students' motivation level in music class decreased over the course of a year, and she suggested that music teachers must find ways to engage their students and provide enjoyable learning opportunities for them.[190]

Woody examined specific characteristics of musical experiences that helped young musicians experience motivation. Several themes emerged in his results. One of the significant

---

[185] Carolina Mega, Lucia Ronconi, and Rossana De Beni, "What Makes a Good Student? How Emotions, Self-Regulated Learning, and Motivation Contribute to Academic Achievement," *Journal of Educational Psychology 106,* no. 1 (2014): 128.

[186] Ibid.

[187] Hadjikou, "Students' Motivation to Engage in Music Lessons," 413.

[188] Ibid., 414.

[189] Ibid., 416.

[190] Ibid., 426.

themes he found was learner-directed learning.[191] This finding suggests that teachers should provide an informal learning environment where students can oversee their own learning, and perhaps incorporate music from outside of school that students listen to and want to learn.[192] This study echoes Mega et al.'s results that showed a link between self-directed learning and motivation.[193] Woody also found that social connection was linked to students' motivation: students thrive in environments where they are connected to their peers.[194] Active participation was another key to students experiencing motivation. When students are allowed a choice in their music selection, that is also linked to motivation. Finally, students experience higher motivation when they enjoy an activity.[195] Comeau et al. experienced similar findings in their study on motivation.[196] They noted that students' persistence was high when the activity was optional and students had a choice in the matter.[197] Finally, Feraco et al. found the same positive correlation between self-regulated learning and motivation.[198]

Schmidt studied motivation among students enrolled in band and found high correlations between self-esteem, internal attributions, and motivation in instrumental music.[199] He also

---

[191] Woody, "Music Education Students' Intrinsic and Extrinsic Motivation," 1325.

[192] Ibid.

[193] Mega et al., "What Makes a Good Student?" 128.

[194] Woody, "Music Education Students' Intrinsic and Extrinsic Motivation," 1326.

[195] Ibid., 1328

[196] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 714.

[197] Ibid.

[198] Feraco et al., "Soft Skills and Extracurricular Activities Sustain Motivation and Self-Regulated Learning at School," 563.

[199] Charles Schmidt, "Relations Among Motivation, Performance Achievement, and Music Experience Variables in Secondary Instrumental Music Students," *Journal of Research in Music Education* 53, no. 2 (2005): 136.

concluded that there are differences in motivation based on students' age. Older students had higher scores on intrinsic motivation while younger students had higher scores on competition and avoiding failure. Chi Wai Chen conducted a study with twelve and thirteen-year old students on their motivation while using iPads to compose music.[200] His results shows that students' level of attainment value increased from the beginning to the end of the project: they were highly motivated if they were able to complete the project. One of the benefits he noted of using iPads to compose is that students who did not otherwise play an instrument found the project accessible.[201]

Oliveira et al. conducted a study to examine whether students' aural aptitude, motivation, and parental support could predict future musical achievement.[202] Although they stated that their study may be somewhat unreliable due to five and six-year old students self-reporting, they found that none of their variables predicted students' future musical achievement. Schatt studied motivation among high school band members and found the promising results that students primarily practiced because of intrinsic motivation, namely for pursuing competence and knowledge.[203]

Need for Further Studies on Motivation

In support of the importance of motivation in the music classroom, researchers have called for further studies on motivation to be conducted. While Hadjikou noted negative attitudes in students' motivation toward music, she focused on measuring students' motivation when

---

[200] Chi Wai Chen, "Mobile Composing," 147.

[201] Ibid., 155.

[202] Oliveira et al., "Can Motivation and Intentions of Parental Support Predict Musical Achievement," 1.

[203] Schatt, "The Music Practice Motivation Scale," 167.

introducing a new curriculum and suggested that future research be conducted a year or two after a new curriculum is introduced.[204] Woody also noted that the field of music education would benefit from additional studies on intrinsic and extrinsic motivation in music students.[205] Bernabé-Valero et al. stated that future studies should be conducted to add to the robustness of information. They also expressed the need for music teacher education programs to include the findings of this research.[206]

While Oliveira et al. concluded that motivation and parental support could not predict student achievement, they also acknowledged several weaknesses in their study that could have accounted for those results.[207] They suggested different ways to gain data from children in the future, such as administering the questionnaire to the children or making them more child-friendly.[208] They also noted that music teachers tended to grade elementary students higher and were lenient with their grading, which impacted the study. They suggested conducting a similar study with middle school students instead of elementary, and who are learning more difficult music.[209] Similarly, Comeau et al. suggested a future study that examines how parenting style affects student motivation.[210]

---

[204] Hadjikou, "Students' Motivation to Engage in Music Lessons," 428.

[205] Woody, "Music Education Students' Intrinsic and Extrinsic Motivation," 1337.

[206] Bernabé-Valero, Blasco-Magraner, and Moret-Tatay, "Testing Motivational Theories in Music Education," 8.

[207] Oliveira et al., "Can Motivation and Intentions of Parental Support Predict Musical Achievement," 28.

[208] Ibid.

[209] Ibid., 29.

[210] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 715.

Schatt suggested focusing future studies on motivation with a focus on student autonomy.[211] Specifically in secondary band students, he believes student autonomy is a key in discovering motivation. Similarly, Wong et al. proposed studying students' motivation when student interests are considered in the learning process and differentiation strategies are appropriately implemented.[212] Motivation is of key interest to music educators and although many studies have been conducted, there is a need for more future studies on this topic.

Differentiation

Differentiated Instruction and its Benefits

Benjamin defines differentiated instruction (DI) or differentiation as "a variety of classroom practices that allow for differences in students' learning styles, interests, prior knowledge, socialization needs, and comfort zones."[213] The guiding theory of differentiation is constructivism, where the learner makes their own meaning out of information and creates their knowledge.[214] Researcher Stephanie Standerfer reinforces this definition by saying that DI is the idea that teachers should structure teaching and learning to fit students rather than trying to fit students into a particular type of learning.[215] Teachers who use DI commit themselves to plan for various student learning styles and differences.[216]

---

[211] Schatt, "The Music Practice Motivation Scale," 169.

[212] Wong et al., "Differentiated Instruction," 150.

[213] Benjamin, *Differentiated Instruction*, 1.

[214] Ibid.

[215] Standerfer, "Differentiation in the Music Classroom," 43.

[216] Ibid.

Benjamin writes about the values of differentiated instruction.[217] One value is choice. When students have a say in what they are learning and how they are learning, they are likelier to experience learning. Another value is how to learn. As students learn new information, they should also learn how to acquire it. A balance of routine and change is essential. Students need familiar rituals and unique experiences within the classroom to excite them. Giving varied assessments is valued within the differentiated classroom. Benjamin believes that students need to experience various evaluations to show their success. Benjamin lists other values such as multiple learning modes, open-endedness, connection, and different teaching styles that are all part of differentiated instruction.[218] Wong et al. concluded that DI helps contribute to students' motivation, as their needs are being met.[219]

Standerfer writes about the benefits of DI, especially in the music classroom.[220] One of the most significant advantages of DI is the ability to reach various learners, whether they are high achieving, struggling, or at grade level.[221] Standerfer breaks down DI into three specific areas: content, process, and product.

In the first area, content, Standerfer discusses the material students need to learn and how they learn it.[222] The benefit of differentiating content is that it meets the needs of most students. As students are at various levels, learners struggling to complete the basics can work on their skill deficiencies. More advanced students can learn more appropriate, challenging material.

---

[217] Benjamin, *Differentiated Instruction*, 8.

[218] Ibid., 8-9.

[219] Wong et al., "Differentiated Instruction," 149.

[220] Standerfer, "Differentiation in the Music Classroom," 44.

[221] Ibid.

[222] Ibid.

Teachers can differentiate by using centers where students are grouped with others of similar abilities and given relevant content. The author provides examples of how a music teacher can set up different centers to benefit learners on grade level, new students who had not been in her class previously, and more advanced students. Students who studied material appropriate to their current level experienced meaningful learning.[223]

The next area Standerfer explores is differentiating the process of learning.[224] This process includes the educational activities the teacher designs for the students to learn new skills and information. She believes that incorporating student choice into the learning process helps ensure that students acquire knowledge in a way that meets their needs. Teachers can incorporate lessons catering to learning styles such as kinesthetic, visual, and aural. When students can choose how to demonstrate their learning in a way that best matches their learning style, that benefits them.[225]

Standerfer's third category of differentiation is the product.[226] The product is the student's demonstration of the learning they have gained. An example of differentiation may be letting students choose a simple composition project based on their choice of words or syllables to represent the rhythms. One of the teachers in Sanderfer's study has her students complete a concert evaluation. She offers different versions based on the student's skill level. For example, an emerging reader uses simple words or faces to answer questions. More advanced learners use more complex musical terms to complete their concert evaluation. Robison suggests similar

---

[223] Standerfer, "Differentiation in the Music Classroom," 44.

[224] Ibid., 45.

[225] Ibid.

[226] Ibid.

strategies involving student choice in the music classroom.[227] He encourages teachers to choose two or more activities that teach the same concept, thus allowing students some choice in their final product. When teaching a concept, teachers must ask themselves what the purpose is so they can create various effective assessments.

Another teacher in Standerfer's study differentiated the product he required students to turn in by first offering them a survey so they could figure out their learning style.[228] He grouped them according to their strengths, such as creativity or technology. Students chose their final product based on their learning styles, so they could write an essay, create a visual representation, or create a presentation using technology.[229] Teachers can provide DI in their classrooms by basing the product on student learning preferences and strengths.

Differentiation in the Music Classroom

Music teachers have successfully utilized DI in their classrooms while teaching various units and concepts. Devany incorporated centers into her teaching after observing her students' learning styles.[230] Her goal was to have her students learn about composers. She also allows students freedom and choice in how they demonstrate knowledge, tailoring the lessons to the students' needs. She found several benefits in addition to addressing many learning styles. When the teacher is not actively teaching the whole group, teachers have more time to interact with and

---

[227] Tiger Robison, "Classroom Management Through Student Choice and Democratic Practices: Part I," *General Music Today* 34, no. 2 (2021): 31.

[228] Standerfer, "Differentiation in the Music Classroom," 45.

[229] Ibid.

[230] Melinda Devany, "Why I Organized Learning Centers in my Classroom," *Teaching Music* 13, no. 1 (2005): 46.

help their students individually. She also witnessed better behavior from her students as they actively engaged with learning at the centers. Her students appeared to have a more positive self-concept, as they felt success during this learning process. Finally, her students gained essential transferrable skills such as problem-solving and critical thinking while engaged in the learning centers.[231]

Vinnard utilizes DI in her classroom using a particular program, the Classroom Drum Circle Project.[232] She teaches both regular and special education students in many of her classes. She notes how differentiation is necessary to reach all learners at an appropriate level. An example of her DI during drum circles is to have one student play the pattern on the drum while their partner plays the same pattern using body percussion. She also incorporates other percussion instruments, such as rhythm sticks, to play more simplified rhythms while the drummers play more intricate ones. She has other groups of students become dancers and move to different rhythms.[233] Through her techniques, she has noticed positive outcomes in her students. Some of those are respect, teamwork, positive behavior, and self-confidence.[234]

Darrow recognizes that students come to music class with various levels of educational readiness, strengths, preferences, and learning styles.[235] She uses DI to better meet students' needs within her classroom by working with small groups and tailoring the curriculum. She also

---

[231] Devany, "Why I Organized Learning Centers in my Classroom," 46.

[232] Valerie Vinnard, "The Classroom Drum Circle Project: Creating Innovative Differentiation in Music Education," *Delta Kappa Gamma Bulletin* 85, no. 2 (2018): 43.

[233] Ibid., 44.

[234] Ibid., 45.

[235] Darrow, "Differentiated Instruction for Students with Disabilities," 29.

discusses the concept of a layered curriculum.[236] In this setting, all students learn the same concept but at differing difficulty levels. She uses the example of note reading, where some students would identify line or space notes, and others would name the notes. Another group could be reading the notes and playing them on instruments. Through another type of DI, some groups of students could work on the same concepts but have different goals, such as social-emotional goals or teamwork. Like Devany, she utilizes various centers with technology and worksheets to facilitate learning.[237] She also suggests collaborating with students' classroom teachers and the students themselves to find the best ways to help them and meet their needs.[238]

Differentiation on the Ukulele

Bernard and Cayari specifically studied ways to use DI while teaching the ukulele.[239] They reiterated that teaching all students the same way is not setting them up for success and that different students need different resources. They suggest teachers differentiate by varying group sizes and allowing students to help choose their modifications when required. Bernard and Cayari specifically use Participatory Music Making (PMM).[240] In PMM, members are actively engaged in making music. PMM is particularly appropriate for DI because students can participate at any level, from keeping a beat to performing a guitar solo.

[236] Darrow, "Differentiated Instruction for Students with Disabilities," 30.

[237] Ibid., 29.

[238] Ibid., 31.

[239] Bernard and Cayari, "Encouraging Participatory Music Making," 30.

[240] Ibid.

Bernard and Cayari reference the research that has been done on the ukulele in community settings by Giebelhausen, Greenberg, and Thibeault.[241] They believe that although there are a variety of online resources for the ukulele, those may work only with higher-level learners. They suggest that music teachers must spend time planning to differentiate ukulele instruction properly.[242] One way they suggest using DI is by using a three-chord song. They use the chords C, F, and G in their example. Their strategy involves the number of times the students play the chord before switching. The basic technique would be to strum the chord only on the downbeat, allowing the students three beats to change chords in 4/4 time. Students would play on the first two beats for a more challenging pattern, giving less time to switch. They could strum on all four beats for a more advanced level. Finally, advanced students could utilize a more intricate strum pattern using a combination of down and up strums. They suggest letting students choose their level.[243]

Another way they use DI is called the whole-group-whole approach.[244] The teacher would begin by teaching the whole class a concept, allowing students to work in small groups and come together to demonstrate what they learned. The small group time could be as short as fifteen seconds to several minutes. The small groups would have a choice in what they need to work on, such as strumming patterns, chords, or playing and singing together.[245] While they suggest the modified strumming techniques and whole-group-whole approaches to DI, very little research has been conducted on their success.

---

[241] Bernard and Cayari, "Encouraging Participatory Music Making," 34.

[242] Ibid., 31.

[243] Ibid., 32-33.

[244] Ibid., 33.

[245] Ibid.

Practical Assessment in the Differentiated Classroom

Along with using DI in the music classroom, teachers must perform meaningful assessments to drive instruction. Researcher Karen Salvador found that assessment led to more individualized instruction in the music classroom.[246] She noted that most general music teachers use informal, full-group evaluations but do not assess individuals.[247] In Salvador's research, she observed general music teacher Hailey Stevens. Stevens preferred assessing her students as they make music, although she also gave written assessments as required by her district.[248] Salvador observed Stevens as her built-in assessments informed her teaching and described it as a woven tapestry. For example, Stevens had students sing back individually in response to her as part of her lesson. While this was part of her teaching, it was also an assessment she completed and recorded in her gradebook simultaneously. She utilized the assessment information in planning new lessons and on-the-spot changes to her teaching.[249] Stevens also used differentiation to assess each child at an appropriate skill level. For example, if she had students echo rhythms individually, she would change the difficulty based on the child's ability level. Her individual assessments also yielded other positive results, such as an increased comfort level of her students performing individually.[250]

Another type of assessment examined in the music classroom is self-evaluation, although more research is warranted as studies have yielded mixed results. Researcher Michael P. Hewitt

---

[246] Karen Salvador, "Assessment and Individualized Instruction in Elementary General Music: A Case Study," *Research Studies in Music Education* 41, no. 1 (2019): 18.

[247] Ibid., 19.

[248] Ibid., 27.

[249] Ibid., 24.

[250] Ibid., 27.

explored the effects of self-evaluation in a group of middle school music students.[251] He acknowledged that self-evaluation had been an essential topic of study in music education.[252] The findings of this study did not indicate positive results as they had in other subjects such as math. Self-evaluation in his research showed little impact on the students' musical performance. Their self-evaluation accuracy was also low.[253] He concluded his study by saying that if self-evaluation is a skill that music educators wish their students to have, more work is needed to teach the craft better.[254]

Gruenhagen examined how music students can gain musical creativity by reflecting on their work.[255] She discussed ways she engages her students with meaningful questions to self-evaluate, such as how they learned to play a part in their music. Her goal in engaging her students in this way was for them to develop a deeper understanding of their musicality and creativity.[256] Her teaching style allows students to learn through discovery in small self-directed groups. Upon reading her students' reflections, she found that they could problem-solve, form their own questions, and hold themselves to a high standard.[257] Before she had students complete reflections, she demonstrated musical questions that challenged their thinking and helped them

[251] Michael P. Hewitt, "The Impact of Self-Evaluation Instruction on Student Self-Evaluation, Music Performance, and Self-Evaluation Accuracy," *Journal of Research in Music Education* 59, no. 1 (2011): 6.

[252] Ibid., 7.

[253] Ibid., 13.

[254] Ibid., 18.

[255] Lisa M. Gruenhagen, "Developing Musical Creativity through Reflective and Collaborative Practices," *Music Educators Journal* 103, no. 3 (2017): 40.

[256] Ibid., 42.

[257] Ibid., 42-43.

take ownership of their learning. She found that her students were better engaged when responsible for their knowledge and reflected upon it.

Valle et al. studied self-assessment and peer assessment in the music classroom.[258] They believe that self-assessment is critical to fostering independent musicianship.[259] The music teachers they used in their research also described the benefits of their students using self-assessment techniques. First-grade music teacher Michelle Turner uses a simple checklist with criteria. She ensures that her students are familiar with it before they fill it out. At the end of the unit, she believed that the checklist helped her adjust instruction based on what level students felt they were. She retaught and clarified concepts many students named as areas needing improvement.[260] Another music teacher in the study, Meghan Phadke, believed that student self-assessments allowed her students to take more ownership of their learning and provided evidence of that learning. She also found that by enabling students to assess themselves and their peers, she could circulate throughout her classroom more and assist individual students.[261] The authors of this study concluded that self and peer assessment did provide positive outcomes. With different studies on self-assessment yielding differing results, more research on this topic could benefit the field of music education.

[258] Christopher Valle et al., "Applications of Peer Assessment and Self-Assessment in Music," *Music Educators Journal* 102, no. 4 (2016): 41.

[259] Ibid.

[260] Ibid., 43.

[261] Ibid., 45.

Maria Montessori and Multi-age Classrooms

Maria Montessori Method and Benefits

Innovative Italian teacher Dr. Maria Montessori studied how children learned naturally and based her philosophies on that information to form a child-centered approach.[262] She believed that children benefitted in various ways from learning in multi-age groups.[263] Several studies support Montessori's methods and multi-age groupings. Researchers Solange Denervaud, Jean-François Knebel, Patric Hagmann, and Edouard Gentaz performed an analysis comparing students receiving Montessori education to those receiving traditional education.[264] While some tests did not reveal differences, the students receiving Montessori education scored higher in academic examinations such as math and language, creativity, and well-being.[265] Another group of researchers found that multi-age students grouped together developed a better sense of community and experienced increased social-emotional learning.[266] Another positive outcome they found was increased learning capability within the multi-age classroom.[267] Although more research is warranted, these studies indicate that Montessori's grouping of multi-aged students provides many positive outcomes.

---

[262] Harris, "The Effects of Music Instruction on Learning in the Montessori Classroom," 26.

[263] "American Montessori Society," accessed April 25, 2023, https://amshq.org/About-Montessori/History-of-Montessori/Who-Was-Maria-Montessori.

[264] Solange Denervaud et al., "Beyond Executive Functions, Creativity Skills Benefit Academic Outcomes: Insights from Montessori Education," *Plos One* 14, no. 11 (2019): 1.

[265] Ibid., 6.

[266] S. Khurram Khan Alwi et al., "Multi-Age Grouping in a Montessori Classroom Effects Positively on a Child's Social and Emotional Development," *Multicultural Education* 7, no. 4 (2021): 162.

[267] Ibid., 164.

Multi-age Music Classrooms

Many music teachers teach combined grades within their classroom and have realized benefits for various reasons and scheduling issues. As early as 1998, Wendy C. Kasten wrote about the need for change in grouping students.[268] She believed that grouping kids according to age was outdated, catered only to those students in the middle, and was done out of convenience rather than what was educationally sound.[269] Kasten also stated many benefits of multi-age classrooms. She discussed consistency from year to year for students as they have the same teachers for more than one year. Social benefits also result from students learning among peers of different ages. She also addressed the benefits Vygotsky talked about when students work with each other to solve problems.[270] Kasten summarized her research by saying that multi-age in and of itself is not enough to show positive benefits: teachers must consider the curriculum, be adequately trained, and have appropriate resources.[271]

Butler researched whether multi-age classrooms increase student success in several areas and found social benefits.[272] She acknowledged that it is not unusual for students to be grouped in multi-age classrooms regularly. She summarized ten different studies, which included multi-age classrooms. One study looked specifically at the music classroom and measured five factors between multi-age and single-age classrooms. The study results showed that students in the multi-age classroom were more satisfied and felt less friction and difficulty when compared with

---

[268] Wendy C. Kasten, "Why Does Multiage Make Sense? Compelling Arguments for Educational Change," *Primary Voices K-6* 6, no. 2 (1998): 2.

[269] Ibid.

[270] Ibid., 5.

[271] Ibid., 8.

[272] Abby Butler, "Do Multiage Classrooms Help Students Succeed?" *General Music Today* 12, no. 1 (1998): 31.

their peers from a single-age classroom.[273] Butler stated that music teachers should attempt to foster an environment where students can experience those positive results. The most significant benefit of multi-age classrooms may not be musical skills but positive student attitudes and self-esteem.[274]

Stuart conducted a study with multi-age students ages six through nine.[275] She found many benefits, primarily social, that this environment provided her students. She cited Vygotsky's idea that students working with higher-level peers can benefit them.[276] She found that older students who model for younger students also benefit by strengthening their knowledge as they teach and assist. Another benefit Stuart found not previously mentioned is the connection to the real world: outside of school and in society, people must work with others of various ages and abilities.[277] Similar to Salvador, she found that the most effective assessment methods in multi-age classes happen naturally, or what she called authentically.[278] In authentic assessment, students perform real-world tasks as a way of being assessed on their knowledge.

Maria Montessori Method and Music

Part of Montessori's philosophy included teaching music. Montessori believed that while teaching music, educators could vary the complexity of concepts to match the needs of multi-age

[273] Butler, "Do Multiage Classrooms Help Students Succeed?" 31.

[274] Ibid.

[275] Shannon K. Stuart et al., "Multiage Instruction and Inclusion: A Collaborative Approach," *International Journal of Whole Schooling* 3, no. 1 (2006): 12.

[276] Ibid., 13.

[277] Ibid.

[278] Ibid., 20.

learners.[279] She favored instruments that students could play while singing, such as stringed instruments.[280] She also believed that each group of people formed their own music, like creating their own language.[281] Although Montessori advocated for music education in the regular classroom and not in a particular room with a different teacher, music teachers can adopt some of her methods to affect student learning positively.[282]

Dansereau and Wyman acknowledged a lack of research regarding Maria Montessori and music.[283] Despite the need for more research, a few music educators have incorporated Montessori's methods within their music classrooms and have seen positive outcomes. One characteristic of Montessori's philosophy that several music teachers have adapted to their teaching is using centers for hands-on learning. As discussed earlier, teachers can use learning centers to provide differentiated instruction. Centers also support the educational philosophies of Maria Montessori and her child-centered approach.[284]

Copeland envisioned a Montessori philosophy for her music classroom. With that in mind, she designed learning centers for her students that allowed them to choose activities appropriate for their level in a multi-age setting.[285] Copeland created the following six centers:

---

[279] Maria Montessori, *The Montessori Method: The Book that Introduced Montessori to America* (New York, NY: Schocken Books, 1964), 207.

[280] Ibid.

[281] Maria Montessori, *The Absorbent Mind* (New York, NY: Henry Holt, 1995), 120.

[282] Diana R. Dansereau and Brooke M. Wyman, "A Child-Directed Music Curriculum in the Montessori Classroom: Results of a Critical Participatory Action Research Study," *Journal of Montessori Research* 6, no. 1 (2020): 20.

[283] Ibid., 21.

[284] Cheryl Copeland, "Teaching Music in a Montessori Fashion: A Vision Realized," *Montessori Life* 17, no. 3 (2005): 32.

[285] Ibid.

skill building, writing, exploration, piano, drama, and Montessori bells.[286] Each center consisted of multiple activities to help teach the same concept. For example, at the skill-building center, students could work on rhythms with a partner, read and perform a rhythm from a card, or write their own rhythm in a journal.[287] After beginning each music class with a full-group activity, she divided her class into small groups to work at the centers, where they read directions from a series of cards she had prepared. She relied on the older students in each group to assist the younger ones.[288] Copeland initially dedicated a great deal of time to creating her lessons and materials to make them work in a Montessori classroom.[289] After adapting her music classroom to reflect the Montessori Method of teaching, she found that her students had greater time to practice the concepts she taught, and better continuity between their regular classroom and music classroom as they both reflected freedom of choice in activities.[290]

Dansereau and Wyman used music centers within a Montessori classroom to investigate children's behaviors over ten weeks.[291] The participants were children ages three through six in the same classroom.[292] The students explored six centers designed by Dansereau and Wyman. Some centers were intended to teach exploration and pitch, melodic direction, and dynamics.[293] Their qualitative data revealed that students positively received the learning centers, became

---

[286] Copeland, "Teaching Music in a Montessori Fashion," 32.

[287] Ibid., 33.

[288] Ibid., 34.

[289] Ibid., 35.

[290] Ibid.

[291] Dansereau and Wyman, "A Child-Directed Music Curriculum in the Montessori Classroom," 22.

[292] Ibid., 23.

[293] Ibid., 24-25.

more comfortable with engaging with the centers, and improved their fixed attention.[294] The authors suggested that others conduct a similar study with a more diverse population of students in the future.[295]

Finally, in their article about the ukulele, Brandl and Croke gave reasons why they believed it fit Montessori's philosophy.[296] The ukulele serves as a type of manipulative Montessori desired to give children a hands-on learning experience.[297] Brandl and Croke also found that the ukulele naturally connects with subjects such as history, literacy, and science, to teach the whole child in a Montessori fashion.[298] They believe that with students learning the ukulele, they could become lifelong learners as Montessori intended.[299] While more research would be essential to music education, incorporating Maria Montessori's philosophy while teaching music has shown some positive results.

Participation in Informal Learning and Popular Music

Participatory Music Making

Participatory Music Making (PMM) combines the constructivist principles of learning through active processes in social settings with Montessori's philosophy of hands-on, child-centered learning. In PMM, all students actively make music, regardless of their skill level.[300]

---

[294] Dansereau and Wyman, "A Child-Directed Music Curriculum in the Montessori Classroom," 26.

[295] Ibid., 28.

[296] Brandl and Croke, "There's a Uke in My Class" 39.

[297] Ibid.

[298] Ibid., 40.

[299] Ibid., 43.

[300] Bernard and Cayari, "Encouraging Participatory Music Making," 29.

Many music educators believe PMM is vital for all students. While performing ensembles such as band, choir, and orchestra only reach a portion of students in the school, it is beneficial for all students to make music.

Bernard, Cayari, and Thibeault use ukuleles to encourage PMM. While Bernard and Cayari feature the community and an extracurricular group on the ukulele, Thibeault features school music classes playing the ukulele. Both stress the importance of welcoming performers of all ability levels into the group. Thibeault specifically highlights that all members work at their individual level while simultaneously contributing to the good of the group.[301] While all authors give tips on encouraging PMM, Bernard and Cayari provide ideas on differentiating ukulele instruction within the school music classroom.[302] The information from these articles clarifies that the ukulele is a natural choice for encouraging all students to participate at a comfortable and challenging level. These articles indicate that more can be done to promote and support music teachers who use the ukulele in their classrooms to help diverse learners, including multi-age classrooms. Thibeault states that music programs including all students and where nobody feels as if they are a non-musician would be a win for music education.[303]

Small coined “musicking," similar to PMM.[304] To “music” as a verb is to take any part in music, whether performing, listening, dancing, or composing.[305] His definition, creation, and use of the word “music” as a verb are closely related to PMM, where Bernard and Cayari even

---

[301] Matthew D. Thibeault, “Music Education for All Through Participatory Ensembles,” *Music Educators Journal* 102, no. 2 (2015): 56.

[302] Bernard and Cayari, “Encouraging Participatory Music Making,” 32-33.

[303] Thibeault, “Music Education for All,” 60.

[304] Christopher Small, *Musicking: The Meanings of Performing and Listening* (Middletown, CT: Wesleyan University Press, 1998): 9.

[305] Ibid.

include the audience as part of the experience.[306] Reese uses the term "musicking" when discussing community music groups.[307] She describes the act of many people playing together as "communal musicking."[308] Reese believes researchers could further study the ukulele and participants' experiences in educational or school community groups.[309]

Informal Learning in the Music Classroom

Informal learning is based on participants learning by experience and is closely connected to PMM and "musicking." Green defined part of informal music learning in a group as "peer direction and unconscious learning through peer observation, imitation, and talk."[310] Hess found that musicking may develop human relationships much stronger than formal learning does.[311] Students involved in informal music-making learn in a hands-on way, much like Montessori envisioned. Green stated that informal learning happens when students experiment and learn from each other.[312] Similarly, Davis believes informal learning naturally occurs as children play and collaborate.[313] Jaffurs offered similar information in her belief that informal music happens

[306] Bernard and Cayari, "Encouraging Participatory Music Making," 29.

[307] Reese, "Uke, Flow and Rock 'n' Roll," 207.

[308] Ibid.

[309] Ibid., 224.

[310] Green, "The Music Curriculum as Lived Experience," 28.

[311] Juliet Hess, "Finding the 'both/and': Balancing Informal and Formal Music Learning," *International Journal of Music Education* 38, no. 3 (2020): 452.

[312] Green, "The Music Curriculum as Lived Experience," 30.

[313] Sharon Davis, "Informal Learning Processes in an Elementary Music Classroom," *Bulletin of the Council for Research in Music Education* no. 198 (2013): 26.

spontaneously and naturally.[314] Hallam, Creech, and McQueen also discussed informal learning being student-centered, where students set goals and move in a self-directed manner.[315]

Hess writes about formal and informal learning happening on a continuum.[316] A classroom with formal learning would have the teacher in the front of the classroom teaching while students listen and absorb information. In informal learning, the teacher takes on the role of a facilitator. As teachers shift their classrooms toward informal learning, one distinction is that students have more choice and ownership over their knowledge. Several authors, such as Green and Jaffurs, write that in informal learning, students may choose to work on songs they are familiar with or enjoy, as opposed to pieces the teacher is familiar with or chooses for them in a more formal setting.[317]

Hess believes a balance of formal and informal music learning is vital for well-rounded students.[318] One participant in her study of formal and informal education stated that it was essential to be able to play in a group quickly.[319] That statement supports informal learning, where members can play in an ensemble at their current playing level and experience immediate success. Part of Hess's inclusion of both formal and informal learning stems from her belief that students can be limited in the future if they only experience one type.[320] Perhaps a student wants

---

[314] Sheri E. Jaffurs, "The Impact of Informal Music Learning Practices in the Classroom, or How I Learned How to Teach from a Garage Band," *International Journal of Music Education* 22, no. 3 (2004): 192.

[315] Susan Hallam, Andrea Creech, and Hilary McQueen, "What Impact Does Teaching Music Informally in the Classroom Have on Teachers, and Their Pedagogy?" *Music Education Research* 19, no. 1 (2017): 44.

[316] Hess, "Finding the 'both/and,'" 443.

[317] Green, "The Music Curriculum as Lived Experience," 28.

[318] Hess, "Finding the 'both/and,'" 441.

[319] Ibid., 447.

[320] Ibid., 453.

to join a jam session and be able to strum chords along with others, or maybe they want to play in a more formal concert band or orchestra. Pendergast and Robinson studied students involved in school music, music outside of school, and students not involved in music.[321] All groups of participants favored a mix of independent learning and teacher-led classrooms as opposed to one end of the continuum or the other.[322] Giddings believes that learning by ear has become a lost art and suggests how teachers can incorporate this into their classrooms to facilitate a jam session to learn more informally by ear.[323] As students learn by ear and engage in informal, small-group learning, they can become more well-rounded musicians.

Informal learning lends itself well to Maria Montessori's methods as it features hands-on discovery learning with the student at the center. Students can experience musical concepts that are appropriate for their skill level by working in small groups and having ownership over their learning. Constructivism is also at play during informal learning as learners work in groups to make new experiences and knowledge their own.

Classroom Culture with Popular Music

Music researchers have written about the disconnect students experience between music in school and outside of school. This disparity can be so great that they do not even relate their school music learning to music they listen to and enjoy on their own.[324] For this reason, music educators such as John Kratus have called for a change in education that makes music classes

[321] Pendergast and Robinson, "Secondary Students' Preferences for Various Learning Conditions and Music Courses," 264.

[322] Ibid., 271.

[323] Steve Giddings, "Let's Play it by Ear: Leading a Jam Session with Your Learners," *Canadian Music Educator* 60, no. 2 (2019): 34.

[324] Kratus, "Music Education at the Tipping Point," 44.

more relevant in students' lives and with which they feel connected.[325] He suggested that teachers should work to teach students in ways that they learn and experience most naturally in their lives rather than setting up a curriculum to meet goals unrelated to student interests.[326] He believes teachers can bridge the gap for students by including music that is part of students' everyday lives and culture, such as popular music.[327]

Pendergast and Robinson voiced similar concerns about the disconnect students experience with school music.[328] They believed that how students learn and listen to music outside of school has changed drastically but how teachers teach music in school, and the type of ensembles offered have not.[329] They conducted a study that supports using popular music in the music classroom. One conclusion they found was that all students in their study preferred piano or guitar class above any other music course offering. Although students involved in school music selected a large music ensemble as their second choice, students involved in music outside of school and nonmusic participants preferred music composition, technology, and popular music groups over a large ensemble.[330] These findings indicate that including popular music ensembles or other music course offerings could attract students who do not choose a traditional school music ensemble.

---

[325] Kratus, "Music Education at the Tipping Point," 42.

[326] Ibid., 45.

[327] Ibid., 46.

[328] Pendergast and Robinson, "Secondary Students' Preferences for Various Learning Conditions and Music Courses," 265.

[329] Ibid., 266.

[330] Ibid., 272.

Davis stated similar reasons for including popular music in her classroom.[331] She wrote that including music important to children in their lives shows respect for them.[332] She also found other positives from using popular music. She noted increased student engagement due to their motivation to learn songs with which they are familiar.[333] Her results also showed that students engaged at various levels, which created natural differentiation as they participated in informal learning using popular music.[334] Sarah Morrison, too, believed music teachers could incorporate popular music into the traditional music classroom.[335] She reiterated that small groups with teacher guidance were effective, students were motivated by having a choice in what they were learning, and music education needs to evolve with the times.[336]

Finally, Clauhs and Powell gave examples of how using popular music, or teaching modern band ensembles, can fulfill the arts standards in the music classroom.[337] An idea they named for meeting the "creating" standard is to have students improvise solos on their instruments. They can do this simply and effectively on a guitar or ukulele. The performance standard fits naturally with popular music and modern band as students actively engage in making music.[338] With this information in mind, educators can incorporate popular music into

[331] Davis, "Informal Learning Processes," 45.

[332] Ibid.

[333] Ibid.

[334] Ibid., 41.

[335] Sarah Morrison, "Popular Music in the Classroom: Where to Begin?" *Canadian Music Educator* 49, no. 2 (2007): 54.

[336] Ibid.

[337] Matthew Clauhs and Bryan Powell, "Teaching the Core Arts Standards in Modern Band," *Music Educators Journal* 108, no. 1 (2021): 25.

[338] Ibid., 28.

their classrooms without compromising meeting learning standards. With the flexibility the ukulele offers in playing chords, melodies, and accompanying the voice, it can be a great vehicle for performing popular music.

Popular Music Pedagogy Training

Despite the value of including popular music in the classroom, researchers have overwhelmingly concluded that teachers need more training in this area. In a study of undergraduate music education coursework conducted by Wang and Humphreys, they found that although there has been a push for including multicultural and popular music in these programs, progress in the United States has been plodding.[339] Their study found that 93 percent of music studied in undergraduate courses was Western music, despite the call for including other types and genres.[340] Their study also showed that popular music only took up .54 percent of undergraduate music education students' curriculum, or less than twenty hours during their four years of undergraduate studies.[341] Several years later, Springer found similar results in a study he conducted on teacher training.[342] He, too, found that preservice music educators studied primarily Western music.[343] Teachers received insufficient training to incorporate popular music, and 90 percent of participants in his study said they took no courses that included popular music pedagogy.[344]

---

[339] Wang and Humphreys, "Multicultural and Popular Music Content in an American Music Teacher Education Program," 22.

[340] Ibid., 25.

[341] Ibid., 26.

[342] Springer, "Teaching Popular Music," 403.

[343] Ibid., 405.

[344] Ibid., 410.

Davis believed that preservice teachers should have the opportunity to learn in informal ways and learn instruments more prevalent in popular music study.[345] One participant in the study by Hallam, Creech, and McQueen believed that a challenge of music teachers incorporating popular music into their classrooms was that they simply did not have the skills. They did not know how to play keyboard, guitar, or drumset.[346] Hess stated that she believes preservice teachers must experience both formal and informal learning to teach in their classrooms.[347] According to Davis and Blair, many undergraduate students depend on written music notation and have not experienced informal learning.[348]

Blackwell, Natherne, and Momohara-Ho conducted a study to examine preservice teachers' perceptions regarding popular music.[349] A positive outcome they found was that after engaging in meaningful experiences, teachers who did not initially favor using popular music in their classrooms may have changed their views.[350] However, despite their potential desire to use popular music, they need to experience this type of teaching and take appropriate coursework during their undergraduate studies.[351] Even teachers who had engaged in informal music-making had not transferred this type of teaching to their classrooms as they lacked pedagogical

[345] Davis, "Informal Learning Processes," 44.

[346] Hallam, Creech, and McQueen, "What Impact Does Teaching Music Informally," 55.

[347] Hess, "Finding the 'both/and,'" 451.

[348] Davis and Blair, "Popular Music in American Teacher Education," 129.

[349] Blackwell, Matherne, and Momohara-Ho, "Preservice Music Teachers Perceptions of Teaching and Learning Popular Music," 49.

[350] Ibid., 62.

[351] Ibid., 51.

information.[352] Music teachers must receive appropriate training to teach popular music to their students successfully and confidently.

Musical Identity

Students and teachers often consider their musical choices to be very personal to them. Davis noted that students might refer to music they listen to outside of school as their own personal music and may even feel a form of possession over it.[353] She stated that teachers need to be aware of and sensitive to students' sense of musical identity.[354] Raychl Smith and Jacqueline Secoy conducted a study to determine how playing the ukulele affected eighteen elementary education majors.[355] The participants wrote about their early lives impacting their eventual music identity.[356] A journal of one of the participants indicated that music teachers could play a role in shaping their students' musical identity.[357] The participants created YouTube playlists as part of their assignments, including songs they learned on the ukulele. Smith and Secoy commented on the power of YouTube as it served as a way for them to practice and express their individual taste in music.[358] More research could be done to determine if student music identity contributes to motivation in the classroom.

---

[352] Blackwell, Matherne, and Momohara-Ho, "Preservice Music Teachers Perceptions of Teaching and Learning Popular Music," 61.

[353] Davis and Blair, "Popular Music in American Teacher Education," 127.

[354] Ibid., 126.

[355] Smith and Secoy, "Exploring the Music Identity Development of Elementary Education Majors Using Ukulele and YouTube," 71.

[356] Ibid., 77.

[357] Ibid., 78.

[358] Ibid., 80.

Conclusion

Using the ukulele in the general music classroom has become prevalent, and music educators demonstrate support for the instrument. Not only does the ukulele provide opportunities for learning many musical concepts, but it also encourages community and camaraderie. Many resources for playing the ukulele are available, including curriculum, songbooks, and YouTube channels. Music educators have provided many tips for playing and teaching the ukulele.

Measuring students' motivation levels is an important research topic, especially for music educators who know the benefits of studying music and want their students to continue in music. While studies have been completed on the topic of motivation in various music classes and ensembles, student motivation has not been studied while learning the ukulele. As motivation is linked with achievement and other positive qualities, music educators desire for their students to experience motivation. Students' opinions should be included in future research on motivation in the music classroom.

Differentiated instruction (DI) tailors materials to students of different levels within one classroom. Music teachers can and should successfully employ DI in their classrooms to best reach their students. Using the ukulele to differentiate is a natural choice for many reasons. Finally, teachers must use effective assessment methods to see what works best in their classrooms and drive instruction.

Montessori was an Italian educator that held specific beliefs about educating children and based that education on how children learned naturally. As part of Montessori's theory and for

various other reasons, many music educators teach multi-age groups within their classrooms. The Montessori method includes the study of music, especially instruments that children can sing while playing. Her use of hands-on learning can be incorporated successfully into modern music classrooms.

Participatory Music Making (PMM) uses constructivist learning principles and Maria Montessori's methods for hands-on, experiential learning. Informal learning or "musicking" happens in the music classroom. Part of informal learning can include popular music to help connect students' music experiences in and out of school. Although many music teachers acknowledge the value of using popular music, more training is needed in this area to support them. Students tend to consider music very personal to them, and music educators can use this information to relate to students.

When music educators combine the best from all these concepts, including ukulele, motivation, differentiated instruction, Maria Montessori and multi-age classrooms, and participatory music making paired with popular music, they can teach the ukulele more effectively. Researchers can improve the practice of ukulele education by finding out which methods of learning helped encourage students' motivation levels and which ways helped students feel the most successful. Although all these concepts have been researched, most authors acknowledged the need for further study in each area proving beneficial to music education. This study, "A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom," used the existing information and past studies on motivation, differentiated instruction, multi-age classrooms, and informal learning to gain insight into the practice of ukulele instruction.

CHAPTER THREE: METHODS

Overview

The purpose of this causal-comparative study was to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele via different curricula in the music classroom. Chapter three provides a description of the research design, participants and setting, intervention, and procedures. Finally, a detailed data analysis plan is provided.

Research Design

One variable was manipulated between two groups in this quantitative causal-comparative study. In quantitative approaches, variables are manipulated, and the research setting is controlled.[359] A large sample of students was utilized in this study, another quantitative research component.[360] 175 fourth through sixth-grade students participated in the study, divided into two equal groups, one which experienced traditional ukulele curriculum and the other which experienced popular music curriculum on the ukulele. They all experienced six weeks of ukulele instruction, receiving forty-five minutes twice per week. Four classes received traditional ukulele instruction via the *Quaver Music* curriculum.[361] The remaining five classes received popular music instruction via the *Music Will* curriculum.[362]

---

[359] Carol Roberts and Laura Hyatt, *The Dissertation Journey: A Practical and Comprehensive Guide to Planning, Writing, and Defending Your Dissertation* (Thousand Oaks, CA: Corwin, 2019), 142.

[360] Ibid., 143.

[361] "Quaver Music," accessed July 11, 2023, Quavered.com.

[362] "Music Will (Formerly known as Little Kids Rock)," accessed July 11, 2023, Musicwill.org.

Many researchers have applied causal-comparative studies to determine if applying an intervention has any effects versus not applying that intervention or applying a different one. Sharp and Tiegs conducted a study comparing data from groups who received fine arts enrichment and those who did not. They employed a quantitative causal-comparative research design to determine if the two groups had statistically significant differences.[363] This study applied the intervention, popular music instruction on the ukulele, to one group, and examined results similarly.

Block and Vidaurre conducted a quantitative causal-comparative study within the school setting.[364] They compared two first-grade groups in different types of learning environments. One group was enrolled in dual-language classes and the other in traditional English-speaking classes. After receiving education in their respective settings, the researchers compared the groups per several variables, including enjoyment of speaking and listening to music in English and Spanish.[365] The current study included two groups of students learning the ukulele through two different curricula and types of music, and levels of motivation were compared via the Intrinsic Motivation Inventory (IMI).

During the ukulele unit, the researcher performed weekly informal checks on students' current motivation level. This check was conducted as an exit ticket. Students wrote a 1, 2, or 3 on a piece of paper to indicate their current level of motivation for learning more ukulele. A 3 indicated they were highly motivated, a 2 indicated they were somewhat motivated, and a 1

---

[363] Laurie A. Sharp and Ali Tiegs, "Impact of WOWW's Fine Arts Enriched Education Programming," *International Journal of Instruction* 11, no. 2 (2018): 25.

[364] Nicholas Block and Lorena Vidaurre, "Comparing Attitudes of First-Grade Dual Language Immersion Versus Mainstream English Students," *Bilingual Research Journal* 42, no. 2 (2019): 129.

[365] Ibid., 140.

indicated they had low motivation. After the first week of instruction, the students receiving the *Quaver* curriculum averaged a 2.53 in motivation from their exit tickets. The students receiving the *Music Will* curriculum averaged a 2.33 in motivation. In the second week, the students experiencing the *Quaver* curriculum averaged a 2.28 in motivation and the students learning via *Music Will* again averaged a 2.33. When the researcher began to see an increase in motivation, she then had students complete a survey on their Chromebooks. Students continued to receive ukulele instruction after the survey was completed so that they could learn the songs from the other group in addition to their assigned group. The results, grouped in four subcategories and an overall total, from the two groups who received different curricula was compared to ascertain potential significant differences in the categories of *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice*, *Pressure-Tension*, and *Total Score* between the group who received traditional ukulele instruction and the group who received popular music ukulele instruction. Ulger implemented a similar research design in high school students (*N*=162) to determine if students who had received arts education showed greater levels of creative thinking than their peers who had not received arts education. A causal-comparative design was implemented in this study.[366]

Limitations

Limitations exist in all study designs.[367] The primary limitation of this study design was the variability between human subjects and the lack of complete random selection of groups. These classes were selected based on pre-existing class lists the school principal and classroom

[366] Kani Ulger, "Comparing the Effects of Art Education and Science Education on Creative Thinking in High School Students," *Arts Education Policy Review* 120, no. 2 (2019): 57.

[367] Gary J. Burkholder et al., *Research Design and Methods: An Applied Guide for the Scholar-Practitioner* (Thousand Oaks, CA: Sage Publications, Inc., 2020), 324.

teachers designed. Therefore, the sample was not completely random. Another limitation is that external factors could not be eliminated. For example, perhaps a student had moved from another school where they had already learned the ukulele and were, therefore, bored by the information that was new to other students. Student attendance was also a limitation. Students who missed one or two classes during the unit were still included in the study, but their survey answers could have been different than if they had attended every class. Another limitation was peer influence. While students worked in small groups or conversed during their school day, their opinion regarding their motivation could have been swayed by a peer, both for the positive or the negative. Another limitation in this study is that the survey was one snapshot of the students' opinions during a six-week unit. Many factors could have influenced how students answered the survey, including their feelings the day and time they were taking it. In this way, not all factors could be adequately measured, and the study design contained limitations.

Variables

The independent variable is the factor that is presumed to change the situation being studied when introduced.[368] The independent variable in this study was the implementation of a music curriculum, *Music Will* and *Quaver*. The dependent variable is the variable to receive the presumed effect of the independent variable.[369] This study's dependent variables were four subcategories and total score of motivation levels of fourth through sixth-grade students that were obtained through survey scores.

[368] Burkholder et al., *Research Design and Methods*, 54.

[369] Ibid.

RQ1: Is there a difference in student motivation between fourth through sixth-grade students who learn the ukulele through traditional curriculum and those who learn the ukulele through popular music curriculum?

H_0: There is no significant difference in student motivation between students who learn the ukulele through traditional curriculum and those who learn the ukulele through popular music curriculum.

Population

The population in this quantitative causal-comparative study included fourth through sixth-grade students in the Rockford Public Schools (RPS) 205 in Rockford, Illinois. Approximately 5,738 students attend grades four, five, and six in various schools in the district.[370] Most elementary schools contain Kindergarten through fifth-grade students, and middle schools hold sixth, seventh, and eighth-grade students. Students in elementary school receive music classes one to three times per week for forty-five minutes. Middle school students only receive music instruction if they are in a performing ensemble. Maria Montessori School (MMS) is a PreK-eighth-grade school in the RPS 205 district. Students are admitted to the school through a lottery system. Students in grades four, five, and six at MMS receive music instruction twice per week for forty-five minutes.

Participants

The participants in this study included fourth through sixth-grade students at MMS of approximately 175 students. The study was introduced to the students as a unit they would

[370] "Illinois Report Card," Rockford SD 205, accessed July 13, 2023, https://www.illinoisreportcard.com/district.aspx?source=studentcharacteristics&source2=enrollmentbygrades&Districtid=04101205025.

complete in music class as part of their curriculum. Their teacher informed them that she would be soliciting their perspectives through surveys upon completion. All students who received ukulele instruction at MMS completed a survey on their Chromebooks during the unit, with the exception of one student whose parents opted him out of the study. Convenience sampling guided the selection of students for this study. In convenience sampling, participants are selected based on availability.[371] Convenience sampling has been implemented in other quantitative studies where the participants are chosen based on availability. Raeburn et al. conducted convenience sampling when surveying musicians regarding their health status.[372] While they stated that random sampling is necessary to generalize research, many research methods necessitate a more flexible approach, such as convenience sampling.[373]

In this study, all participants received six weeks of ukulele instruction in the general music classroom. There are nine classes of approximately twenty-three students each at MMS. Four classes were selected to receive traditional ukulele curriculum through *Quaver Music*.[374] The remaining five classes were selected to receive popular music ukulele curriculum through *Music Will*.[375]

---

[371] Burkholder et al., *Research Design and Methods*, 63.

[372] Susan D. Raeburn et al., "Surveying Popular Musicians' Health Status Using Convenience Samples," *Science & Medicine, Inc.* 18, no. 3 (2003): 113.

[373] Ibid.

[374] "Quaver Music," accessed July 11, 2023, Quavered.com.

[375] "Music Will (Formerly known as Little Kids Rock)," accessed July 11, 2023, Musicwill.org.

In quantitative research, a large sample size increases the accuracy of the results.[376] Raeburn et al. included 226 participants.[377] Javad Mehraban selected 100 participants comparing psychological well-being between students who received music education and students who did not.[378] In Ulger's causal-comparative study examining creative thinking between students who had received arts and students who had not, 162 participants were utilized.[379] Applying Field's method for determining the sample size, considering one variable and a medium effect size predicted, the sample size should include at least 55 participants.[380] A more significant sample number of 175 will help increase study power.[381] In keeping with traditional research methods, statistical power of .7 is necessary for a medium effect size, $\alpha = .05$.[382]

The two groups for this study were selected based on the music teacher's class schedule and number of students in each class. There were nine classes that fit the criteria for inclusion in the study. Since one group would contain one more class than the other, the researcher based the groups on class sizes that would include the most equal amount of students in each group. Since half of the groups were engaged with the traditional ukulele curriculum, and the other half popular music ukulele curriculum, the researcher selected four classes that comprised approximately 90 students and another five classes that comprised approximately 90 students.

---

[376] John J. Creswell and J. David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Thousand Oaks, CA: Sage Publications, Inc., 2018), 172.

[377] Raeburn et al., "Surveying Popular Musicians' Health Status Using Convenience Samples," 113.

[378] Javad Mehraban, "The Effect of Music Education on Students' Psychological Well-Being," *Management and Educational Perspective* 1, no. 2 (2020), 1.

[379] Ulger, "Comparing the Effects of Art Education and Science Education on Creative Thinking in High School Students," 57.

[380] Burkholder et al., *Research Design and Methods*, 72.

[381] Ibid., 71.

[382] Ibid.

Each group comprised similar demographics, or ninety fourth through sixth-grade students at MMS, approximately half male and half female. Although the researcher decided that students who missed three or more classes during the study were permitted to take the survey but their answers would not be included in the data, no students missed this amount of class, so all student data was included.

Setting

Maria Montessori School (MMS) is in the center of Rockford, IL. It is part of the RPS205 Public School District and comprises grades Pre-K through eight. Over 600 students attend this school. MMS utilizes a lottery system where families zoned in the RPS205 district can elect to have their children attend if selected. The school comprises 54.4% white students, 16% black students, 17% Hispanic students, 10.1% mixed-race students, 2.2% Asian students, and .3% other.[383] MMS has 18.8% of students who are considered low-income. Nine percent of students in this school have Individualized Education Programs (IEP).[384] Per the Maria Montessori model, students in this school learn in multi-age classes. This site was selected as the researcher works as a music teacher at this school. The music room was the physical space where the ukulele unit was taught. The music room is the old stage area of the school. The administration team comprises a principal and an assistant principal who oversee various aspects of the school, curriculum, discipline, and teacher evaluations. A fine arts coordinator and fine arts dean at the district level also supervise all programs and work with music teachers to purchase materials and equipment and coordinate a performance calendar.

---

[383] "Illinois Report Card," Montessori Elementary School, accessed June 5, 2023, https://www.illinoisreportcard.com/School.aspx?source=studentcharacteristics&source2=iep&Schoolid=041012050252085.

[384] Ibid.

Instrumentation

The instrument administered to gain information on students' motivation levels while completing a ukulele unit experiencing either *Quaver Music* or *Music Will* curriculum was the Intrinsic Motivation Inventory (IMI).[385; 386] The IMI, created by Ryan and McAuley et al., was developed from the self-determination theory (SDT). The IMI examines subjects' motivation in various dimensions or subcategories. The dimensions include *Interest-Enjoyment*, *Perceived Competence*, *Effort-Importance*, and *Tension-Pressure*.[387] IMI has been administered in many studies to measure intrinsic motivation and self-regulation. The *Interest-Enjoyment* dimension score is considered the measure of intrinsic motivation.[388] As a result, more items from the *Interest-Enjoyment* dimension are included in the inventory (see Appendix A).[389] The actual statements comprising the IMI are often modified to address the study's specific needs.

The purpose of the instrument, the adapted IMI, was to measure motivation levels among fourth through sixth-grade students during a six-week ukulele unit experiencing one of two possible curricula. The researcher adapted the IMI items to fit the needs and study verbiage requirements (see Appendix B). IMI use is permitted within academic fields for research projects.[390] McAuley et al. measured motivation among subjects after playing the basketball

---

[385] "Quaver Music," accessed July 11, 2023, Quavered.com.

[386] "Music Will (Formerly known as Little Kids Rock)," accessed July 11, 2023, Musicwill.org.

[387] Edward McAuley, Terry Duncan, and Vance V. Tammen, "Psychometric Properties of the Intrinsic Motivation Inventory in a Competitive Sport Setting: A Confirmatory Factor Analysis," *Research Quarterly for Exercise and Sport* 60, no. 1 (1989): 50.

[388] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

[389] Ibid.

[390] "Center for Self-Determination Theory (CSDT)," accessed October 13, 2023, https://selfdeterminationtheory.org/questionnaires/.

game "HORSE" via a Likert-type scale.[391] The inventory that participants accessed comprised statements intended to measure each IMI dimension, although the various categories were not separated until the data analysis stage.[392] The IMI is designed as a flexible assessment that can be adapted for many subjects and research types.[393] The researcher may select which items to include in his or her survey without adversely affecting the study results.[394]

Other researchers have adapted and administered the IMI to measure participants' motivation levels. Mandigo et al. conducted a study measuring students' motivation levels when participating in physical education activities.[395] They utilized the IMI *Interest-Enjoyment* and *Perceived Competence* categories adapting them to their needs. They also adapted Likert-type scale responses to child-friendly language, including answer choices such as "No way!" and "For sure!"[396] López-Martinez et al. administered the IMI to measure undergraduate students' motivation when learning via gamified techniques.[397] The researchers adapted the IMI to their study and included the statements meant to solicit information from the categories of *Interest-Enjoyment, Perceived Competence, Effort-Importance,* and *Tension-Pressure*.[398] Cortright et al.

---

[391] McAuley et al., "Psychometric Properties of the Intrinsic Motivation Inventory," 49.

[392] Ibid., 54.

[393] Ibid., 49.

[394] Ibid., 55.

[395] James Mandigo et al., "Children's Motivational Experiences Following Autonomy-Supportive Games Lessons," *European Physical Education Review* 14, no. 3 (2008): 407.

[396] Ibid., 412.

[397] Ana López-Martinez et al., "Using Gamified Strategies in Higher Education: Relationship between Intrinsic Motivation and Contextual Variables," *Sustainability* 14, no. 17 (2022): 4.

[398] Ibid.

studied motivation levels among undergraduate students via the IMI.[399] They were investigating whether more highly motivated students achieved higher grades in the course. The results showed a correlation between intrinsic motivation and a higher course grade among male students. Conversely, female students demonstrated no correlation.[400]

A confirmatory factor analysis conducted on the IMI depicted significant internal validity. Table 1 depicts the results of this data.

Table 1: Intrinsic Motivation Inventory (IMI) Validity

Categories	Enjoyment	Competence	Effort	Pressure
Enjoyment	1.0			
Competence	.247	1.0		
Effort	.522	.268	1.0	
Pressure	.359	.184	.389	1.0

Source: McAuley et al., "Psychometric Properties of the Intrinsic Motivation Inventory," 55.

Table 2 is from McAuley et al.'s study completed with participants playing the basketball game "HORSE" and depicts the instrument's reliability. However, the IMI is highly adaptable, and validity and reliability remain significant even when questions are ordered differently, or the researcher adapts it to his or her needs.[401]

[399] Ronald N. Cortright et al., "Higher Levels of Intrinsic Motivation are Related to Higher Levels of Class Performance for Male but not Female Students," *Advances in Physiology Education* 37, no. 3 (2013): 227.

[400] Ibid., 228.

[401] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

Table 2: Intrinsic Motivation Inventory (IMI) Reliability

IMI Subscales	Items	Cronbach's alpha
Interest-Enjoyment	5	.78
Perceived Competence	5	.80
Effort	4	.84
Pressure-Tension	4	.68

Source: McAuley et al., "Psychometric Properties of the Intrinsic Motivation Inventory," 53.

In McAuley's example from above, five items each measure the *Interest-Enjoyment* and *Perceived Competence* categories. Four items each measure the *Effort* and *Pressure-Tension* categories. The full version of the IMI comprises forty-five questions, although examples are provided on how to adapt the inventory to meet study needs without compromising validity. Each subcategory contains the following number of statements on the questionnaire: *Interest-Enjoyment - 7, Perceived Competence - 6, Effort/Importance - 5, Pressure/Tension – 5, Perceived Choice – 7, Value/Usefulness – 7, and Relatedness – 8.*[402] The more concise, twenty-two-question version explicitly implemented to measure intrinsic motivation comprises the following number of statements for each subcategory: *Interest-Enjoyment – 7, Perceived Competence – 5, Perceived Choice – 5, and Pressure/Tension – 5*.

Participants responded to each statement via a Likert-type scale where 1 = *strongly disagree,* 2 = *disagree,* 3 = *neutral,* 4 = *agree,* and 5 = *strongly agree.* An emoji face to represent each answer was shown next to it. Adaptations to make the scale more child-friendly were deemed acceptable. Likesas and Zachopoulou simplified the scale for their students by only including "yes" and "no" as possible answers.[403] Mandigo et al. maintained the seven-point

[402] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

[403] G. Likesas and E. Zachopoulou, "Music and Movement Education as a Form of Motivation in Teaching Greek Traditional Dances," *Perceptual and Motor Skills* 102, no. 2 (2006): 555.

Likert-type scale but applied more colorful wording for each extreme, such as “No way!” and “For sure!” They previously pilot-tested these word choices and adapted them slightly for their study.[404]

In this study, the researcher administered the twenty-two-question modified IMI. Each question resulted in a numerical value from one to five. Some of the questions were reverse-scored, which means if the participant chooses the answer “strongly agree,” it was scored as a one instead of a five. This reverse scoring allowed statements to be worded in a nonredundant manner and encouraged the participant to reflect before answering the same way as he or she did in the previous question. The lowest possible score was twenty-two, and the highest was 110. The higher the number, the more motivation the participant experienced, except for the category of *Pressure-Tension* which indicates a negative effect on overall intrinsic motivation. In the categories of *Interest-Enjoyment*, *Perceived Competence,* and *Perceived Choice*, a higher number represents a positive effect on overall intrinsic motivation the participant experienced.[405]

In this study, the researcher administered the questionnaire via a Google Form each student completed on his or her Chromebook during the third week of the six-week ukulele unit. The questionnaire required five to ten minutes to complete and was completed during music class. The teacher/researcher oversaw scoring and compiling data. No other individuals assisted with scoring. After administering the questionnaire, the researcher compiled the scores over approximately a one-week duration. Students who had missed the day of the survey took it in the music room when they returned and were monitored by the researcher. Upon all students

---

[404] Mandigo et al., “Children’s Motivational Experiences Following Autonomy-Supportive Games Lessons,” 412.

[405] “Intrinsic Motivation Inventory (IMI),” accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

completing the survey, the researcher ensured that the Google survey no longer allowed any responses to be submitted.

Procedures

The researcher obtained permission from Liberty University IRB before beginning any research (see Appendix C).[406] Fourth through sixth-grade students at Maria Montessori School (MMS) in Rockford, IL, receive music classes twice weekly for forty-five minutes. Attendance in these classes is a requirement, barring any absence from school. A request was made to the school's principal to allow research in the classroom (see Appendix D). The researcher informed parents of the study through the announcements feature in the See-Saw computer application, to which all families are connected, approximately a month before the students completed the motivation survey. She reminded them through the school's monthly newsletter. Students' parents who did not wish their children to participate in data collection obtained opt-out forms directly from the researcher through e-mail. (see Appendix E). One student's guardian returned a completed opt-out form. All other students completed assent forms on their Chromebooks prior to completing the survey during the ukulele unit (see Appendix F). This section will detail the process of obtaining permission from the study site, selecting participants, and collecting data.

Prior to the study, the researcher conducted a pilot study using similar survey items and responses. She identified fifteen students, nine male and six female, divided equally among fourth, fifth, and sixth grade, to complete a survey with the same Likert-type responses with emojis and discuss whether they understood the responses and could select answers they felt

[406] "Liberty University," Institutional Review Board, accessed June 19, 2023, https://www.liberty.edu/graduate/institutional-review-board/.

were most accurate.[407] The researcher was the only individual who read and analyzed the surveys. The researcher e-mailed the parents of these students to inform them of the study approximately two weeks prior. They had the option to complete an opt-out form via e-mail if they wished for their child not to participate (see Appendix I). None of the students' parents chose to opt their child out of the pilot study. The students met together with their Chromebooks in the music classroom. The pilot study survey was placed into their Google Classroom application for them to access (see Appendix N and Appendix 0). Students completed an assent form prior to completing the survey (see Appendix J).

The pilot study was conducted (see Appendix O) to gain insight if the survey answers with emojis were an effective way for students to understand and communicate their answers. The students responded to three sample statements with *strongly agree, agree, neutral, disagree, or strongly disagree*; each of these utilized emoji faces. Following the sample statements to which students responded, they were asked, "Were you able to choose an answer you thought best described your thoughts?" Fourteen students responded with "yes" and the final student did not answer the question. The next question was "Were the emojis helpful to understand the answers?" Eleven students responded "yes." Two students responded, "not really," one student responded "idk," and one student responded with "kind of." The final question was whether students had additional suggestions. Eleven students said "no." One student did not respond and one student said, "I do not know." One student said to make the emojis bigger because it was hard to see their facial expressions. The final student requested the statements be turned into questions. The students were also told that if they had any feedback or suggestions that they

[407] Burkholder et al., *Research Design and Methods*, 169.

preferred to communicate verbally, that was an option as well. No students gave any verbal feedback.

The music teacher informed the students at the beginning of the unit that their perspectives were part of a research study and would be welcomed. The unit comprised one of two ukulele curricula: *Quaver Music* Curriculum or *Music Will* Curriculum and *Modern Band Method Ukulele Book* (see Appendix G).[408; 409; 410] All students, regardless of participation in the survey, received six weeks of instruction, totaling 540 minutes (see Appendix H). Once per week, she informally determined the students' motivation for ukulele learning through an exit ticket. They were instructed to write 1, 2, or 3 on their exit ticket anonymously. Number three indicated that they were highly motivated to learn more ukulele. Number two indicated that they were somewhat motivated to learn more ukulele. Number one indicated that they had low motivation to learn more ukulele. This determined the peak time to survey students on their motivation level. Each forty-five-minute class included a five to ten-minute review and tuning, ten to fifteen minutes of full-group instruction, and ten to fifteen minutes of small-group work. All students had the opportunity to participate in the study, and the researcher selected the two groups who receive different curricula based on the class numbers. Students expressed their willingness to participate in the survey by completing a digital assent form on the first page of the survey they completed via their Chromebook.

---

[408] "Quaver Music," accessed July 11, 2023, Quavered.com.

[409] "Music Will (Formerly known as Little Kids Rock)," accessed July 11, 2023, Musicwill.org.

[410] Kris Gilbert et al., *Modern Band Method: Ukulele Book 1*, (Milwaukee, WI: Hal Leonard Publishing, 2023).

When the researcher determined the students' motivation was not decreasing and likely at the highest point, students whose parents had not opted them out completed the adapted twenty-two-item Intrinsic Motivation Inventory (IMI), where participants responded to statements regarding their motivation during the ukulele unit (see Appendix K) via Google Form.[411] The researcher adapted the wording of the scale to the specific music and ukulele activities the students completed. The survey utilized a five-point Likert-type scale. Each page comprised one statement about the ukulele unit to which the student responded with *strongly agree, agree, neutral, disagree,* or *strongly disagree.* An emoji face to represent each answer was shown next to it. Responses were awarded points from one (*strongly disagree*) to five (*strongly agree*). After participants completed the survey, the researcher totaled points of participants' answers to identify their total motivation score, with each subcategory having a higher score meaning that the participant experienced higher motivation, with the exception of the *Pressure-Tension* score. In the *Pressure-Tension* subcategory, a higher score indicated a negative influence on the participant's overall intrinsic motivation.[412] Individual categories within the survey were analyzed. Several questions needed to be reverse-scored, meaning that the strongly disagree response counted as five points and the strongly agree response counted as one point. In this way, the students were encouraged to read the statements more thoroughly instead of clicking the same answer as they progress from screen to screen. Each screen contained one statement for the student to respond to. At the end of the survey, there was a submit button and a screen to show them they had completed it (see Appendix L). The surveys submitted anonymously through

[411] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

[412] Ibid.

Google, where the teacher/researcher reviewed the data. Once all data was collected, the researcher did not allow Google to collect any more survey information.

The data collected in this study was digital. Each student accessed their password-protected Chromebooks to complete and submit the surveys. The researcher stored the information from the surveys and the data she input into SPSS software on her laptop, which is password-protected and requires a two-factor authentication for access. Following the data collection, the researcher finished teaching the ukulele unit to each group. She incorporated some of each curriculum at the end for both groups after they had already completed the survey in order to balance out the groups' knowledge and playing abilities. She also ended the unit with having them work independently for a small amount of time at the end of each class to complete a punch card of skills (see Appendix M). Students who completed all the tasks on the punch card were awarded by having their music class avatar hung on the Ukulele Wall of Fame in the music classroom. Finally, she gave the students an exit ticket survey where they had to answer if the reward of having their avatar on the wall helped motivate them or if it did not change their desire to complete their punch card. The results of the students available to vote were that 82 students said that the reward of their avatar made them want to complete their punch cards more than without the reward, and 78 said it did not change their desire to complete their punch card. Out of all the participants, 75 students completed all the tasks on their punch card and got their ukulele avatar on the wall.

Data Analysis

The data analysis for this quantitative causal-comparative study was a multivariate analysis of variance (MANOVA). This is the most appropriate statistical analysis in a study with

one dichotomous independent variable and multiple dependent variables.[413] The independent variable was the curriculum categorized as two possibilities, *Quaver Music* and *Music Will*, that separate groups of students experienced in music class.[414; 415] The dependent variables were student motivation as measured by the adapted Intrinsic Motivation Inventory (IMI) scores and categorized into five categories which were *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice*, *Pressure-Tension*, and *Total Score*.[416] The MANOVA was employed to determine whether the groups differed significantly. In addition, correlations between subcategories were examined.

Other researchers have also applied MANOVAs to answer research questions. Ismail, Anuar and Loo conducted a study on the effects of online distance music learning in gifted students.[417] They found significant differences in the dependent variables of empowerment, usefulness, success, interest, and caring. The independent variables were gender and location.[418] Through their study, they were able to determine if the independent variables influenced the dependent variables.

---

[413] "Laerd Statistics," One-Way Manova in SPSS Statistics, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss.php.

[414] "Quaver Music," accessed July 11, 2023, Quavered.com.

[415] "Music Will (Formerly known as Little Kids Rock)," accessed July 11, 2023, Musicwill.org.

[416] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

[417] Md Jais Ismail, Azu Farhana Anuar, and Fung Chiat Loo, "From Physical to Virtual: A New Learning Norm in Music Education for Gifted Students," *International Review of Research in Open and Distributed Learning* 23, no. 2 (2022): 44.

[418] Ibid., 52-53.

Burns et al. conducted a MANOVA design while studying participants' skin temperature, muscle activity, and heart rate after listening to a specific type of music or silence.[419] They investigated significant differences among the music and silence groups in each category. They did find significant differences in the category of anxiety.[420]

For the MANOVA, the independent variable was the curriculum which the students received with the following groups (*k*): students receiving *Quaver* curriculum (*n* = 82) and students receiving *Music Will* curriculum (*n* = 93). For a MANOVA, the sample size of 175 exceeds the required minimum of 100 when assuming a medium-size effect with a statistical power of .07, $\alpha = .05$.[421] Several assumptions must be tenable to conduct the MANOVA properly. Two or more dependent variables must be measured at the continuous level. The independent variable must comprise two categorical groups.[422] The MANOVA requires independence of observations. The two groups cannot include the same participants.[423] The final seven assumptions require statistical tests before performing the MANOVA. A scatterplot was constructed via SPSS software to check for outliers and include or suppress them as needed. A correlational test was conducted to check for multivariate normality. Boxplots and Mahalonobis distance tests were conducted to assess multicollinearity. The researcher conducted a

[419] Jason L. Burns et al., "The Effects of Different Types of Music on Perceived and Physiological Measures of Stress," *Journal of Music Therapy* 39, no. 2 (2002): 101.

[420] Ibid., 108.

[421] Burkholder et al., *Research Design and Methods*, 72.

[422] "Laerd Statistics," One-Way Manova in SPSS Statistics, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss.php.

[423] Ibid.

Kolmogorov-Smirnov test to check for normality. A Box's M test was conducted to assess similar variances and covariances.[424]

Following measures of central tendency and assumption testing, a MANOVA was conducted to determine if the two groups' differences in the four subcategories and the total results exist. Conducive to MANOVA reporting standards, the results included degrees of freedom (*df*), observed *t*-value (*t*), significance (*p*), and effect size (*ES*). Results were considered significant if $p < .05$.[425] Effect size will be calculated via Cohen's *d*, ranging between .2 and .8 depending on the observed effect size.[426] The null hypothesis was rejected at the 95% confidence level.

[424] "Laerd Statistics," One-Way Manova in SPSS Statistics, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss.php.

[425] Susan E. Morgan, Tom Reichert, and Tyler R. Harrison, *From Numbers to Words: Reporting Statistical Results for the Social Sciences* (New York: Routledge, 2017), 54.

[426] Burkholder et al., *Research Design and Methods*, 73.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this causal-comparative study was to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele through different curricula in the music classroom. This chapter analyzes the dichotomous independent variable and the five dependent variables and provides descriptive statistics, assumptions, and results of the statistics. This chapter concludes with a summary that indicates whether the hypothesis is rejected or failed to be rejected.

Research Question

RQ1: Is there a difference in student motivation between fourth through sixth-grade students who learn the ukulele through traditional curriculum and those who learn the ukulele through popular music curriculum?

Five categories in which participants were measured are in Figure 1.

Figure 1: Subcategories of Dependent Variables

Null Hypothesis

H_0: There is no difference in student motivation between fourth through sixth-grade students who learn the ukulele through traditional curriculum and those who learn the ukulele through popular music curriculum.

Descriptive Statistics

The participants in this study included fourth through sixth-grade students enrolled in Maria Montessori School in Rockford Public Schools 205 in Rockford, IL. The number of participants who completed surveys during the unit was 175, which met the required minimum sample size when assuming a medium effect size with the statistical power of .7, $\alpha = .05$.[427] The researcher copied data from students' Google surveys into Excel, and then transferred the data into the IBM SPSS Statistics software. Descriptive statistics for the independent and dependent variables are presented in Table 3.

Table 3: Descriptive Statistics

Categories	Instruction Type	*M*	*SD*	*N*
Interest-Enjoyment	Quaver	25.634	6.4416	82
	Music Will	26.882	7.2289	93
	Total	26.297	6.8802	175
Perceived Competence	Quaver	18.537	3.8109	82
	Music Will	19.538	4.2415	93
	Total	19.069	4.0650	175
Perceived Choice	Quaver	15.390	3.9651	82
	Music Will	15.946	3.9408	93
	Total	15.686	3.9506	175
Pressure-Tension	Quaver	13.634	3.5469	82
	Music Will	11.183	3.8840	93
	Total	12.331	3.9164	175
Total	Quaver	73.1951	11.50034	82

[427] Burkholder et al., *Research Design and Methods*, 72.

Categories	Instruction Type	*M*	*SD*	*N*
	Music Will	73.5484	11.16528	93
	Total	73.3829	11.29219	175

Assumptions Testing

Before conducting a MANOVA, the researcher tested ten assumptions. Assumptions 1 through 3 did not require statistical analysis. Assumption 1 requires two or more continuous dependent variables. This study comprises five dependent continuous variables. Assumption 2 states that there are two or more independent, categorical variables. This study included two categorical independent variables. Assumption 3 details that the study must maintain independence of observations, or two groups that do not cross over in any way. The participants in each group were exclusive to one group. Assumptions 1 through 3 were met before any statistical analysis was performed.[428] Assumptions 4 through 9 required statistical analysis via SPSS software.

Linear Relationships

The researcher applied the scatterplot to identify a potential linear relationship between each pair of dependent variables and each group of independent variables, as shown in Figure 2. The researcher visually examined these scatter plots and concluded that all pairs presented a linear relationship.

[428] "Laerd Statistics," One-Way Manova in SPSS Statistics, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss.php.

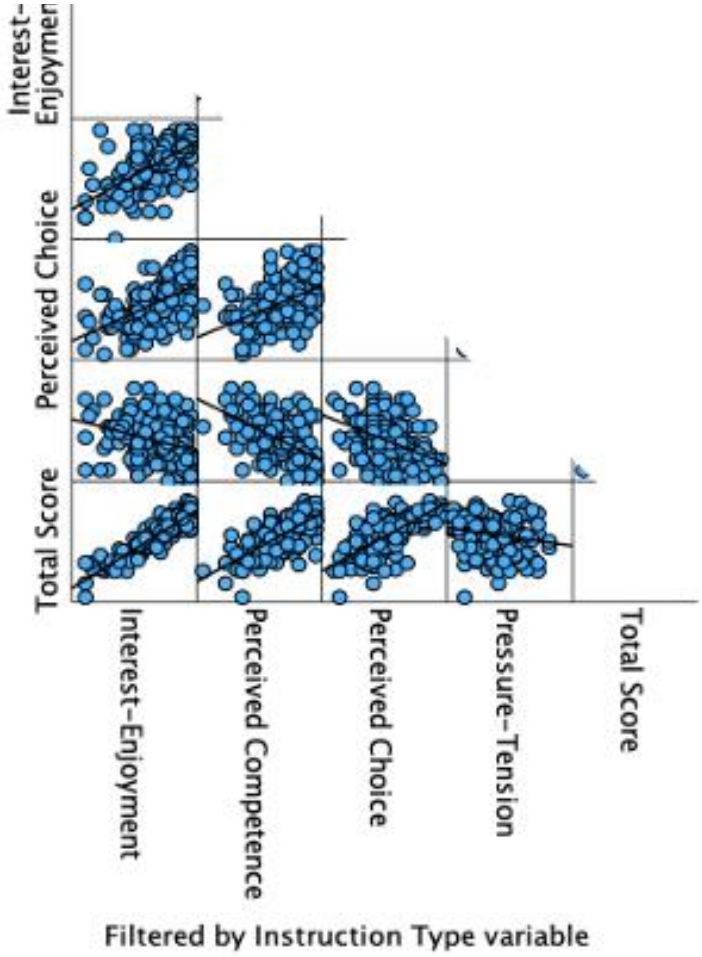


Figure 2: Scatterplot Matrix

Multicollinearity

To assess multicollinearity, the researcher conducted a Pearson product-moment correlational test. Significant correlations existed between a few of the independent variables. There was a correlation of .92 between the *Total Score* and the subcategory of *Interest-*

Enjoyment. Correlations greater than .70 indicate possible multicollinearity.[429] There also existed a correlation of .72 between the *Total Score* and the subcategory of *Perceived Competence*. This assumption is violated and is a limitation. However, this is not unexpected since the scores from these two subcategories are part of the total score. This is shown in Table 4.

Table 4: Correlations

		Instruction Type	Interest-Enjoyment	Perceived Competence	Perceived Choice	Pressure-Tension	Total Score
Instruction Type	*r*						
	p						
Interest-Enjoyment.	*r*	.091					
	p	.232					
Perceived Competence	*r*	.123	.635**				
	p	.104	<.001				
Perceived Choice	*r*	.070	.544**	.443**			
	p	.354	<.001	<.001			
Pressure Tension	*r*	-.313**	-.311**	-.535**	-.414**		
	p	<.001	<.001	<.001	<.001		
Total Score	*r*	.016	.920**	.717**	.697**.	-.180*	
	p	.837	<.001	<.001	<.001	.017	

A boxplot was constructed and Mahalonobis distance tests were conducted to assess the presence of univariate or multivariate outliers. These outliers are scores whose value is extremely small or large compared to others.[430] In case number one, the *Total Score* and *Perceived Competence* subcategory in the boxplot presented as a univariate outlier, as evidenced in Figure 3.

[429] "Laerd Statistics," Assumptions I, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss-5.php.

[430] Ibid.

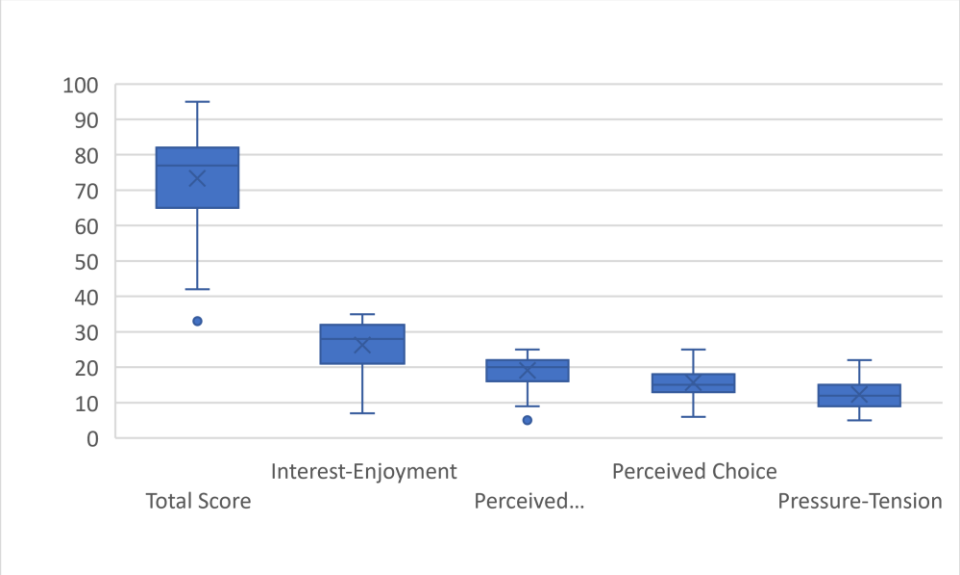


Figure 3: Boxplot of Dependent Variable Scores

A Mahalonobis distance test was conducted to check for multivariate outliers. The results were all between .88 and 1.13. Cases greater than 1.0 can be considered outliers.[431] However, these cases averaged around 1, so this assumption was tenable. Because there were more than fifty cases in this study, the researcher conducted a Kolmogorov-Smirnov test to assess multivariate normality. If $p < .05$, the data are not normally distributed.[432] For each category, $p < .05$, presenting a violation of multivariate normality. This is seen in Table 5.

Table 5: One-Sample Kolmogorov-Smirnov Test

	Interest-Enjoyment	Perceived Competence	Perceived Enjoyment	Pressure-Tension	Total Score
p	<.001	<.001	.003	.025	<.001

[431] "Complete Dissertation by Statistics Solutions," Univariate and Multivariate Outliers, accessed December 12, 2023, https://www.statisticssolutions.com/univariate-and-multivariate-outliers/#:~:text=Multivariate%20outliers%20can%20be%20identified,of%20the%20variables%20being%20assessed.

[432] "Laerd Statistics," Assumptions I, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss-5.php.

The researcher tested for homogeneity of variance-covariance matrices by conducting a Box's M test. Results indicated p =.072, therefore, the assumption was tenable.[433] A Levene's test was conducted to assess the assumption of homogeneity of variances. Results indicated p > .05, demonstrating equal variance; therefore, the assumption was tenable.[434]

Results

A one-way multivariate analysis of variance (MANOVA) was conducted to determine if there was a statistical significance in means between the dependent variables, *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice*, *Pressure-Tension*, and *Total Score*, and the independent variables, *Music Will* and *Quaver* curriculum.

The model was significant: $F(4, 170) = 5.071$, p <.001, V = .893, η_ρ^2 = .107 . The test of between-subjects effects determined the *Pressure-Tension* subcategory was significantly different between *Music Will* and *Quaver*, as shown in Table 6.

Table 6: Tests of Between-Subjects Effects

Source	Dependent Variable	*M* Square	F	*p*	η_ρ^2
Instruction Type	Interest-Enjoyment	67.83	1.44	.232	.008
	Perceived Competence	43.67	2.69	.104	.015
	Perceived Choice	13.47	.86	.354	.005
	Pressure-Tension	261.86	18.82.	<.001	.098
	Total Score	5.45	.042	.84	0

[433] "Laerd Statistics," Assumptions I, accessed November 23, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss-5.php.

[434] "Laerd Statistics," Assumptions II, assessed December 12, 2023, https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss-14.php.

Summary

The purpose of this causal-comparative study was to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele through different curricula in the music classroom. A one-way MANOVA with two independent variables and five dependent variables was appropriate for determining significance. A linear relationship existed between each pair of variables, evidenced by scatterplots. One pair of dependent variables, *Total Score* and *Interest-Enjoyment*, showed evidence of multi-collinearity, thus violating the assumption. One case out of 175 was an extreme univariate outlier. The assumption of multivariate normality was also violated. Box's M and Levene's test determined the assumptions of homogeneity of variance-covariance matrices and homogeneity of variance were tenable. The MANOVA was conducted despite the minor violations. The null hypothesis was rejected: $F(4, 170) = 5.071$, $p < .001$, $V = .893$, $\eta_p^2 = .107$. Ad hoc tests determined the *Pressure-Tension* variable demonstrated statistical significance in variability between the *Music Will* and *Quaver* groups.

CHAPTER FIVE: DISCUSSION

Overview

This chapter examines the effects and implications of the results of this causal-comparative study. The researcher also discusses conclusions based on the results of these findings. The researcher collected data from fourth through sixth-grade students at Maria Montessori School in Rockford, IL, via a Google Form regarding their motivation levels while experiencing a ukulele unit with one of two curricula: *Music Will* or *Quaver*. Chapter Four presented the results of the study. Chapter Five will discuss the implications and limitations of those results and provide topics for future research studies.

Discussion

The purpose of this causal-comparative study was to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning the ukulele through different curricula in the music classroom. The independent variable in this study was the implementation of two music curricula, *Music Will* and *Quaver*. This study's dependent variables were four subcategories and the total score of motivation levels of fourth through sixth-grade students that were obtained through survey scores. This study provided motivation levels of students experiencing the different curricula on the ukulele broken down into the following four categories: *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice,* and *Pressure-Tension,* as well as the *Total Score*. Participants in this study received six weeks of ukulele instruction twice per week for forty-five minutes in their general music classroom setting. When the researcher determined, through a weekly exit ticket, that the students' motivation for learning may be at its highest, the students completed the twenty-two-item Intrinsic Motivation Inventory, with wording altered to accommodate the ukulele unit, to each student during music class. The

researcher totaled the answers in an Excel spreadsheet and imported them into SPSS. A Multivariate Analysis of Variance (MANOVA) was conducted on the data.

The overall MANOVA showed significant difference between the groups of the independent variables. Ad hoc tests showed that no significant differences resulted in student motivation between the two curricula in categories of *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice*, and *Total Score*. In the category of *Pressure-Tension*, however, there was a significant difference between *Music Will* and *Quaver*. $P < .001$ in the *Pressure-Tension* subcategory.

Conclusions

The results contributed to the recently emerging research on ukuleles in the music classroom, popular music curriculum, and student motivation and can be incorporated into general music teachers' classroom practices. This study showed that students who experienced *Music Will* ukulele instruction experienced a reduced level of *Pressure-Tension* compared to students who participated in the *Quaver* curriculum. The mean *Pressure-Tension* score for participants who experienced *Quaver* was 13.63, and the *Pressure-Tension* score for participants who experienced *Music Will* was 11.18, with standard deviations of 3.54 and 3.88, respectively. *Pressure-Tension* is considered a negative indicator of motivation, meaning that participants who experience lower levels of *Pressure-Tension* experience higher levels of intrinsic motivation.[435] This subcategory judges whether participants feel pressure to be successful at a particular activity.[436] While the students who participated in *Music Will* experienced lower means in the

[435] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

[436] Vera Monteiro, Lourdes Mata, and Francisco Peixoto, "Intrinsic Motivation Inventory: Psychometric Properties in the Context of First Language and Mathematics Learning," *Psychology* 28, no. 3 (2015): 435.

Pressure-Tension categories, their means in *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice*, and *Total Score* were higher, although the differences were not statistically significant. While much of the rationale for the difference in this category has not been specifically tested, significant differences in the presentation and focus of material in the two curricula could have been contributing factors.

One notable difference between the two curricula was that *Quaver* implemented more traditional songs like *Five Green and Speckled Frogs* and songs written specifically for the *Quaver* curriculum such as *Ukulele Shakee*. In contrast, *Music Will* incorporated popular songs familiar to students outside the music classroom, such as *Uptown Funk* and *Can't Stop the Feeling*. However, other differences between the two curricula could also have contributed to the significant difference. The *Quaver* curriculum relies heavily on introducing individual notes such as the open string notes G, C, E, and A, and expecting the students to learn and play the notes of the open strings and C major scale before learning any chords. Much time is expended practicing these notes before the students can perform any complete songs. The students learn to read the notes traditionally on the music staff as they are playing them. When the *Quaver* curriculum finally introduces chord playing, it introduces C, F, and then G7. The curriculum does not expand beyond those three chords.

In contrast, The *Music Will* curriculum focuses on chords early in the process. As soon as students learn the parts of the ukulele, the C chord is introduced. While teachers can adapt the curriculum to their needs, the chords taught following C are am, F, then G, respectively. Students are able to play *Shout* using just the C and am chord, and then progress to *Can't Stop the Feeling* after learning C, am, and F, only a few lessons into the unit. Students who were in the *Music Will* group experienced lower levels of *Pressure-Tension* as indicated in the results. It is a possibility

that by experiencing success early in the unit by performing familiar songs, this group felt less pressure as they progressed on the ukulele.

In addition, strumming patterns can be simplified to accommodate a variety of learners through differentiated instruction within the same classroom. For example, students struggling to switch chords can strum half notes, such as pattern 17 in Figure 4 below, so they have an overall slower tempo and more time to switch. Students who are average players can strum quarter notes, such as pattern 1 below, or strum three quarter notes and use the fourth beat to switch. Above average players can strum a down/up pattern to create eighth notes, such as pattern 3 below, or can even strum an island strum pattern (down, down/up, up, down/up) or choose from a variety of patterns containing both down and up strums for an additional challenge.

	Beat 1	Beat 2	Beat 3	Beat 4
1.	↓	↓	↓	↓
2.	↓	↓	↓	↓↑
3.	↓↑	↓↑	↓↑	↓↑
4.	↓	↓↑	↓	↓↑
5.	↓↑	↓	↓↑	↓
6.	↓	↓↑	↑	↓
7.	↓↑	↑	↓↑	↑
8.	↓	↓	↓↑	↓↑
9.	↓	↓↑	↓↑	↓↑
10.	↓↑	↑	↑	↑
11.	↓↑	↑	↑	↓↑
12.	↑	↓↑	↓↑	↑
13.	↓	↓↑	↓	↓
14.	↑	↑	↑	↑
15.	↑	↑	↑	↓↑
16.	↑	↓↑	↑	↓↑
17.	↓		↓	
18.		↓		↓
19.	↓↑	↓	↓	↓
20.	↓↑	↑	↓	↓↑
21.	↓		↑	↓↑
22.	↓	↑	↓	↓
23.	↓↑	↓↑	↓	↓
24.	↑	↓	↓	↓

	Beat 1	Beat 2	Beat 3	Beat 4
25.	↓↑	↓↑	↓	↑
26.	↓↑		↓↑	
27.	↑	↓↑	↓↑	↓↑
28.	↑	↓	↓	↓↑
29.	↓↑	↓↑	↑	↓↑
30.	↓	↓	↑	↓↑
31.	↓↑	↓↑	↓↑	↓
32.	↑	↓↑	↑	↓

Figure 4: 32 Ukulele Strum Patterns

Source: "Ukulele Go," 32 Ukulele Strumming Patterns, accessed October 4, 2023, http://ukulelego.com/stuff/32-ukulele-strumming-patterns/.

Another difference is the amount of space allowed for flexibility within each curriculum. While either curriculum can be modified, the *Quaver* lessons are sequenced in a specific order, and time estimates are provided for approximately how much time the teacher should devote to each lesson. *Music Will* does not provide a specific order per se or time estimate but allows the teacher to select lessons, tutorial videos, and songs based on students' needs. The amount of material and songs provided by *Music Will* far outweighs the number of songs in the *Quaver* curriculum, allowing the teacher to accommodate many learners at beginning through advanced playing levels. In this way, the *Music Will* curriculum is more loosely structured, with teacher input a significant contribution.

Many students experienced fatigue, calluses, or sore thumbs and fingers that could have altered their motivation levels. Students in the *Music Will* group who were strumming primarily chords instead of individual notes had more soreness and blisters on their thumbs. Students who met for music class two days in a row each week such as Thursday and Friday, rather than being more spaced out like Monday and Friday, had less time for their thumb and fingers to heal in between classes. Each class contained a few students with long or artificial nails which made ukulele playing more difficult. In addition, a few students had slings or casts for part of the unit

which caused them to play in an adapted manner or use different fingers than traditionally used for each chord. Each class out of the nine comprised various classroom management and academic differences, which led the teacher to slightly alter the lessons' pace. For example, some students worked better and more productively in small groups and were therefore allowed to spend more time in small groups. Other small groups became disruptive, so their class had to be taught in a more structured manner. Some classes had more difficulty and needed to review material in greater detail and more slowly before learning additional material.

The results of this MANOVA were significant. While all categories must be taken together to show significance, the biggest difference between the two curricula was in the *Pressure-Tension* subcategory. For classroom music teachers planning to teach the ukulele and best motivate their students, practical application of these study results and conclusions may be of interest. Teachers may also benefit from including activities that are popular with their student population, such as gamification, creating healthy competitions out of learning, and allowing students to work at their own pace through punch cards, as the researcher in this study did at the end of the unit. The last two weeks of the unit, after the students completed their surveys, the researcher allowed them approximately fifteen minutes of independent and small group work per class to complete sixteen tasks on a ukulele punch card (see Appendix M). These punch cards were not part of either curriculum, but something she and a colleague wrote and modified. Inclusion of such an activity and the amount of students who completed many skills may indicate that sticking strictly to one curriculum may not serve all students' needs. Instead, students may benefit from the teacher selecting the most salient features from several curricula based on individual students' needs and classroom goals, and supplementing with further resources as needed. Many students completed the cards in their entirety during that time and even asked to

come in outside of class time to finish them. Their extrinsic reward for completing their punch card was receiving their music class avatar on a Ukulele Wall of Fame within the classroom. Seventy-five students completed all the tasks on the card and had their avatar on the wall (see Appendix P).

The type of motivation measured in this study specifically points to the self-determination theory, which focuses on which conditions encourage or discourage people to flourish.[437] This theory focuses on autonomy, relatedness, and competence. The participants responded to items on the IMI, which was created in response to the SDT.[438] This instrument particularly focused on their intrinsic motivation. One of the subcategories, *Perceived Competence*, relates directly to one of the categories within the SDT. Participants were not offered any extrinsic reward in return for learning the concepts on the ukulele which they were being taught. The second theory incorporated in this study is the constructivist theory. This theory's guiding principles include students using active sensory processes such as playing instruments, and feeling a sense of motivation.[439] Piaget, who developed this theory, also discovered that children learn best through action.[440] This study utilized that theory by having students actively participate in learning the ukulele through hands-on activities.

[437] Ryan and Deci, *Self-Determination Theory*, 3.

[438] McAuley et al., "Psychometric Properties of the Intrinsic Motivation Inventory," 50.

[439] "What is Constructivism?" Western Governors University, accessed April 6, 2023, https://www.wgu.edu/blog/what-constructivism2005.html#close.

[440] Schmitt, "The Thought-Life of Young Child," 25.

Connections to Previous Research

In the last ten years, music teachers have implemented the ukulele more widely in general music classroom settings.[441] Teachers select the ukulele because of its versatility, variety of genres in which it can be played, students' ability to play and sing simultaneously, and various available strumming patterns to accommodate learners at different levels.[442] Ukuleles are also affordable, another practical choice for school music teachers. Researchers such as Doebler have studied the ukulele to determine why teachers enjoyed using the instrument within their music classrooms. They noted positive aspects such as the ukulele's flexibility and accessibility, and its being fun and easy to learn.[443] The ukulele has also been selected in community settings to engage participants of varying playing abilities.[444] The current study capitalized on the ukulele's strengths. The ukulele's versatility facilitated students learning many different concepts, such as scales and chords, while singing. Students could play strumming patterns intersecting with their current learning level and challenging them to advance to more complex concepts. The present research study specifically focused on students' motivation levels while learning the ukulele through the *Quaver* or *Music Will* curricula. The motivation levels were divided into the subcategories of *Interest-Enjoyment*, *Perceived Competence*, *Perceived Choice, and Pressure-Tension.* Although the *Interest-Enjoyment* subcategory only comprises part of the inventory, seven items on the 22-item inventory are dedicated to *Interest-Enjoyment* while only five items

---

[441] Giebelhausen, "So, You're Thinking About Starting a Ukulele Program?" 38.

[442] Tamberino, *Uke Can Do It,* 77.

[443] Doebler, "Ukulele in Music Class," 3.

[444] Reese, "Uke, Flow, and Rock 'n' Roll," 214.

are dedicated to the other three subcategories.[445] This is the only subcategory of the IMI that is said to directly assess intrinsic motivation.[446] However, *Perceived Competence* and *Perceived Choice* are positive predictors of intrinsic motivation, while *Pressure-Tension* is a negative predictor.[447] Hence lower levels of *Pressure-Tension* in the *Music Will* group could indicate higher levels of motivation.

Music researchers have investigated the topic of student motivation for practical reasons such as achievement and retention of students in their music ensembles.[448] Understanding what motivates students can benefit music educators. Woody found that people experience a higher level of motivation when they perceive a high level of empowerment.[449] This finding could relate to the *Perceived Choice* subcategory of the IMI in the current study, as that subcategory measures students' perceived agency. Positive correlations between motivation and other exogenous factors, such as academic achievement, also encourage researchers to investigate student motivation factors so that they can experience these positive benefits.[450] Hadjikou found that students' motivation levels decreased over a few years, thus encouraging music teachers to engage and motivate their students in innovative ways.[451] Students' motivation levels also carry greater affects than just academic achievement. Levels of motivation can also affect their

[445] "Intrinsic Motivation Inventory (IMI)," accessed July 24, 2023, https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

[446] Ibid.

[447] Ibid.

[448] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 706.

[449] Woody, "Music Education Students' Intrinsic and Extrinsic Motivation," 1325.

[450] Mega, Ronconi, and De Beni, "What Makes a Good Student?" 128.

[451] Hadjikou, "Students' Motivation to Engage in Music Lessons," 413.

feelings about themselves and their identity.[452] Higher motivation levels are also correlated with students choosing to complete other, optional learning activities.[453] The current study questioned students regarding their motivation levels, disaggregated into four subcategories. Further research could include student interviews to glean more information about their motivation levels, or could measure them over a longer period of time. Hadjikou, Woody, and Barnabé-Valero stated that further research on student motivation would benefit the field and that teacher education programs should include the findings.[454; 455; 456]

Previous researchers have explored Participatory Music Making (PMM) and the application of popular music in the music classroom. They have discovered benefits for all students participating in music, not just students who choose to participate. Some of these benefits are better relationships with others and hands-on learning and experimentation that allow for music learning through understanding and interaction.[457; 458] PMM includes all students actively making music at any skill level.[459] While playing the ukulele, PMM is possible as all students can contribute musically at their present learning level while contributing to the overall group.[460] Providing opportunities for all students to participate and feel musical is a positive for

---

[452] Evans et al., "Self-Determined Motivation for Practice in University Music Students," 1098.

[453] Comeau et al., "The Motivation for Learning Music (MLM) Questionnaire," 714.

[454] Hadjikou, "Students' Motivation to Engage in Music Lessons," 426.

[455] Woody, "Music Education Students' Intrinsic and Extrinsic Motivation," 1337.

[456] Barnabé-Valero, Blasco-Magraner, and Moret-Tatay, "Testing Motivational Theories in Music Education," 8.

[457] Hess, "Finding the 'both/and,'" 452.

[458] Green, "The Music Curriculum as Lived Experience," 30.

[459] Bernard and Cayari, "Encouraging Participatory Music Making," 29.

[460] Thibeault, "Music Education for All," 56.

music education.[461] Some potential benefits include better peer relationships and learning through interaction and collaboration with peers.[462]

In many cases, individuals learn popular music more informally than traditional music repertoire. In informal music learning, the teacher assumes more of a mentor role rather than a full-group instructor.[463] This classroom environment allows the students to assume responsibility for their learning, work in small groups, and learn by ear.[464] Previous studies have also demonstrated that students feel a disconnect between school music and the music they consume for pleasure outside of school.[465] Pendergast and Robinson believe that school music choices are outdated and need to be further examined to meet student needs and interests. Despite the belief that informal music learning and popular music learning are essential to students, there is a lack of training in these fields in music education programs.[466] Davis asserts that preservice teachers should incorporate informal methods when teaching and learning instruments commonly played in popular music as part of their studies.[467] The current study compared a traditional ukulele curriculum to a more informal, popular music curriculum, with results showing that students experienced higher levels of motivation with the popular music curriculum.

---

[461] Thibeault, "Music Education for All," 60.

[462] Davis, "Informal Learning Processes," 26.

[463] Hess, "Finding the 'both/and,'" 443.

[464] Giddings, "Let's Play it by Ear," 34.

[465] Pendergast and Robinson, "Secondary Students' Preferences for Various Learning Conditions and Music Courses," 266.

[466] Wang and Humphreys, "Multicultural and Popular Music Content in an American Music Teacher Education Program," 22.

[467] Davis, "Informal Learning Processes," 44.

Limitations

Several factors can limit the results of research studies. As discussed in Chapter Four, a few of the assumptions were violated, which is common when using real-world data.[468] The researcher continued to run the MANOVA despite these violations. While the assumption of multivariate normality was violated, the researcher proceeded with the MANOVA as Pillai's trace works adequately when the distributional assumption is violated.[469] Furthermore, the parametric assumption of normality is more worrisome for samples fewer than 30.[470] The assumption of multicollinearity was also violated in two instances. This assumption is more concerning when the ratio of, as one author put it, "sample size is equal and the sample size of the smaller group is large, or when there are five groups."[471] Those conditions were not the case in this study. The final violated assumption was that of an outlier. Removing the one outlier did not affect the results so the MANOVA was conducted with the outlier included.

This study could be challenging to accurately reproduce for several reasons. The teacher in this study maintained experience teaching both curricula. In other situations where the teacher may have experience with only one or neither of the curricula, outcomes could vary. The researcher did not complete either curriculum in its entirety during this unit. Students unfamiliar with *Quaver* music or the popular songs in the *Music Will* curriculum could also affect the

---

[468] "Laerd Statistics," One-Way Manova in SPSS Statistics, accessed November 23, 2023, https://statistics.laerd.com/spss-tutorials/one-way-manova-using-spss-statistics.php.

[469] Holmes Finch, "Comparison of the Performance of Nonparametric and Parametric MANOVA Test Statistics when Assumptions are Violated," *Methodology* 1, no. 1 (2005): 37.

[470] "Mayo Foundation for Medical Education and Research," Parametric and Nonparametric: Demystifying the Terms, accessed January 11, 2024, https://www.google.com/search?q=mayo+education+parametric+versus+nonparametric&oq=mayo+education+parametric+versus+nonparametric&aqs=chrome..69i57j33i160l2.4517j0j7&sourceid=chrome&ie=UTF-8.

[471] Finch, "Comparison of the Performance of Nonparametric and Parametric MANOVA," 37.

outcome. Students' varying familiarity levels with popular music songs or their feelings about those songs could affect the outcome of a similar study. The teacher could inadvertently show bias toward the curriculum that is his or her favorite, potentially affecting the outcome of the study. While songs from the *Music Will* curriculum were explicitly implemented, the researcher employed the Transpose extension for Chrome rather than retuning the ukuleles or implementing a capo.[472] In a replication of the study, the researcher could choose to use a capo instead, which may require the students to learn entirely different chords and change the outcome of the study.

Another limitation of this study is the amount of data collected and the students self-selecting their responses. Although the researcher administered the survey at participants' peak motivation, it was only a five-to-ten-minute time frame in which they provided answers over a six-week unit. Further, the number they provided on their exit ticket regarding their current motivation may not have been reflected in their IMI survey answers. Some students' answers were highly inconsistent. While items are included in the IMI to ensure consistency, the researcher speculated that not all students thoroughly read the items. For example, some students selected answered that seemed to contradict one another throughout the survey or were all "extremely agree" or "extremely disagree" answers. Although these scores were not suppressed, there is variability inherent to including student participants. The researcher answered many questions regarding the meaning of a few words on the IMI, indicating that the verbiage may have been limiting for some students. Students could have potentially not been truthful or not truly understood their own motivation or feelings while selecting answers. Further, they may have not understood that the survey was anonymous and therefore did not want to be completely

[472] "Transpose," accessed October 5, 2023, https://transpose.video.

honest or upset the teacher. The researcher did not interview students nor conduct formal observations which could have provided more context to this data.

Recommendations for Future Research

Studying motivation among music students is crucial to informing teachers of best practices for maintaining students' attention. This current study provides opportunities for future study topics on the intersections between the ukulele and motivation. Further research on implementing the ukulele in the general music classroom could include a qualitative study that utilizes similar classroom procedures but, instead of accessing 175 participants, includes fewer participants and more in-depth discussions through a hermeneutic phenomenological study.

In this type of qualitative study, the researcher would gather data through student journals and focus group interviews during the ukulele unit. The researcher would provide students with prompts to which to respond in their journals at the end of class each day. Obtaining narratives from people who have experienced the phenomenon is of utmost importance in the process.[473] This phenomenological research would seek to gain participants' perspectives on their lived experience of learning the ukulele.[474] The researcher would also utilize parent questionnaires to gain further information on their children's experiences learning the ukulele.

Other quantitative studies could be conducted with minor adjustments to the research design. Administering the survey at multiple benchmarks during the unit to determine when students experienced the highest motivation levels and how responses evolved could provide further information. Another future study could compare the participants' performance abilities

---

[473] Jamie Ranse et al., "Obtaining Individual Narratives and Moving to an Intersubjective Lived-Experience Description: A Way of Doing Phenomenology," *Qualitative Research* 20, no. 6 (2020): 948.

[474] John W. Creswell and Cheryl N. Poth, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (Thousand Oaks, CA: Sage Publications, Inc., 2018): 45.

between the groups to determine which curriculum resulted in better music performance abilities or if each curriculum addressed adequate material and concepts. Another study could measure the relationship between students' confidence levels as measured by the *Perceived Competence* subcategory and their actual demonstrated performance skills via a playing test to determine self-assessment abilities. Furthermore, a correlational analysis would be appropriate for determining the relationship between student motivation and frustration. A qualitative or mixed-methods study could also examine participants' self-perceptions of motivation and how it evolved during the unit with resulting thematic and discourse analysis. The IMI could be administered, but more open-ended questions would be appropriate to ascertain why students responded as they did. Additionally, the full forty-five item IMI could be administered to participants to gain greater data. This full IMI would include the additional subcategories of *Effort-Importance*, *Value-Usefulness,* and *Relatedness*.

Including more demographic information about participants could help glean more specific details in a future study. In the current study, all grade four through six students were grouped anonymously. In a future study, grade levels could be separated, or conducted with participants in the same grade levels or class to ascertain potential differences between students of different ages or genders. Groups could also be divided into students with ukulele experience and students without ukulele experience. Including more background and demographic information could further the research on ukulele playing in the general music classroom.

Another future study could produce information from music teacher data who teach with the ukulele. They could provide the skills they most value among their students, such as music reading, ensemble playing, scale knowledge, melody playing, or strumming patterns. Knowing whether teachers value sight before sound or sound before sight in their music students could

help them choose a curriculum most valuable to them. Finally, each group could be taught both curricula, with surveys being administered after each one. This way, the participants' *Quaver* versus *Music Will* responses can be compared to determine their motivation evolution over time and between curricular implementations.

Summary

The purpose of this causal-comparative study was to compare the motivation levels of two groups of multi-age fourth through sixth-grade students learning through different curricula on the ukulele in the music classroom. The guiding theories in this study were Ryan and Deci's self-determination theory and Piaget's constructivist theory.[475] The researcher reviewed literature pertaining to implementing the ukulele in the general music classroom, motivation, differentiation, Maria Montessori and multi-age classrooms, and participation in informal learning and popular music.

The research included participants from Maria Montessori School fourth through sixth grade in Rockford, IL. The researcher administered the digitized Intrinsic Motivation Survey comprising twenty-two items to two groups of students via their Chromebooks while they experienced six weeks of ukulele learning delivered via the *Music Will* and *Quaver* curriculum, respectively. The study results indicated a statistically significant difference between the two groups. Ad hoc testing indicated significance for the *Pressure-Tension* subcategory. Although many factors can contribute to students' motivation and achievement in music classrooms each day and no two students or teachers are alike, these findings support employing the *Music Will*

[475] "Piaget's Theory of Constructivism," Teach-Nology, accessed June 1, 2023, https://www.teach-nology.com/currenttrends/constructivism/piaget/#:~:text=Piaget's%20theory%20of%20constructivism%20argues,teaching%20methods%2C%20and%20education%20reform.

ukulele curriculum to achieve greater motivation among students. Future research could focus on what, specifically, made students perceive decreased levels of *Pressure-Tension*, and subsequently, greater motivation, when experiencing this curriculum.

Bibliography

Alwi, S. Khurram Khan, Zobia Zaman, Romana Bano Ghaffar, Saima Tabasum, and Syed Waqarul Hasan. “Multi-Age Grouping in a Montessori Classroom Effects Positively on a Child’s Social and Emotional Development.” *Multicultural Education* 7, no. 4 (2021): 162-167.

“American Montessori Society.” Accessed April 25, 2023. https://amshq.org/About-Montessori/History-of-Montessori/Who-Was-Maria-Montessori.

Barron, John. “Lessons From the Bandstand: Using Jazz as a Model for a Constructivist Approach to Music Education.” *Music Educators Journal* 94, no. 2 (2007): 18-21.

Benjamin, Amy. *Differentiated Instruction: A Guide for Elementary School Teachers*. New York: Routledge, 2013.

Bernabé-Valero, Gloria, José Salvador Blasco-Magraner, and Carmen Moret-Tatay. “Testing Motivational Theories in Music Education: The Role of Effort and Gratitude.” *Frontiers in Behavioral Neuroscience* 13, no. 172 (2019): 1-9.

Bernard, Cara Faith, and Christopher Cayari. “Encouraging Participatory Music Making Through Differentiation on the Ukulele.” *General Music Today* 34, no. 1 (2020): 29-36.

Blackwell, Jennifer, Nicholas Matherne, and Cathlyn Momohara-Ho. “Preservice Music Teachers Perceptions of Teaching and Learning Popular Music.” *Journal of Music Teacher Education* 31, no. 3 (2022): 49-65.

Block, Nicholas, and Lorena Vidaurre. “Comparing Attitudes of First-Grade Dual Language Immersion Versus Mainstream English Students.” *Bilingual Research Journal* 42, no. 2 (2019): 129-149.

Brandl, Dave, and Bill Croke. “There’s a Uke in My Class.” *Montessori Life* (2021): 38-43.

Burkholder, Gary J., Kimberley A. Cox, Linda M. Crawford, and John H. Hitchcock. *Research Design and Methods: An Applied Guide for the Scholar-Practitioner*. Thousand Oaks, CA: Sage Publications, Inc., 2020.

Burns, Jason L, Elise Labbé, Brooke Arke, Kirsten Capeless, Bret Cooksey, Angel Steadman, and Chris Gonzales. “The Effects of Different Types of Music on Perceived and Physiological Measures of Stress.” *Journal of Music Therapy* 39, no. 2 (2002): 101-116.

Butler, Abby. “Do Multiage Classrooms Help Students Succeed?” *General Music Today* 12, no. 1 (1998): 28-31.

“Center for Self-Determination Theory (CSDT).” Accessed October, 13, 2023. https://selfdeterminationtheory.org/questionnaires/.

Chi Wai Chen, Jason. "Mobile Composing: Professional Practices and Impact on Students' Motivation in Popular Music*." International Journal of Music Education* 38, no. 1 (2020): 147-158.

Clauhs, Matthew, and Bryan Powell. "Teaching the Core Arts Standards in Modern Band." *Music Educators Journal* 108, no. 1 (2021): 25-33.

Cogdill, Susan H. "Applying Research in Motivation and Learning to Music Education: What the Experts Say." *Update: Applications of Research in Music Education* 33, no. 2 (2015): 49-57.

Comeau, Gilles, Veronika Huta, Yuanyuan Lu, and Mikael Swirp. "The Motivation for Learning Music (MLM) Questionnaire: Assessing Children's and Adolescents' Autonomous Motivation for Learning a Musical Instrument." *Motivation and Emotion* 43, no. 5 (2019): 705-718.

Complete Dissertation by Statistics Solutions. "Univariate and Multivariate Outliers." Accessed December 12, 2023. https://www.statisticssolutions.com/univariate-and-multivariate-outliers/#:~:text=Multivariate%20outliers%20can%20be%20identified,of%20the%20variables%20being%20assessed.

Copeland, Cheryl. "Teaching Music in a Montessori Fashion: A Vision Realized." *Montessori Life* 17, no. 3 (2005): 32-35.

Cortright, Ronald N., Heidi L. Lujan, Amanda J. Blumberg, Julie H. Cox, and Stephen E. DiCarlo. "Higher Levels of Intrinsic Motivation are Related to Higher Levels of Class Performance for Male but not Female Students." *Advances in Physiology Education* 37, no. 3 (2013): 227-232.

Crawford, Renée. "Rethinking Teaching and Learning Pedagogy for Education in the Twenty-First Century: Blended Learning in Music Education." *Music Education Research* 19, no. 2 (2017): 195-213.

Creswell, John W., and J. David Creswell. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, CA: Sage Publications, Inc., 2018.

Creswell, John W., and Cheryl N. Poth. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: Sage Publications, Inc., 2018.

Dansereau, Diana R., and Brooke M. Wyman. "A Child-Directed Music Curriculum in the Montessori Classroom: Results of a Critical Participatory Action Research Study." *Journal of Montessori Research* 6, no. 1 (2020): 19-31.

Darrow, Alice-Ann. "Differentiated Instruction for Students with Disabilities: Using DI in the Music Classroom." *General Music Today* 28, no. 2 (2015): 19-32.

Davis, Sharon. “Informal Learning Processes in an Elementary Music Classroom.” *Bulletin of the Council for Research in Music Education* no. 198 (2013): 23-50.

Davis, Sharon G., and Deborah V. Blair. “Popular Music in American Teacher Education: A Glimpse Into a Secondary Methods Course.” *International Journal of Music Education* 29, no. 2 (2011): 124-140.

Denervaud, Solange, Jean-François Knebel, Patric Hagmann, and Edouard Gentaz. “Beyond Executive Functions, Creativity Skills Benefit Academic Outcomes: Insights from Montessori Education.” *Plos One* 14, no. 11 (2019): 1-13.

Devany, Melinda. “Why I Organized Learning Centers in my Classroom.” *Teaching Music* 13, no. 1 (2005): 44-47.

Doebler, Grace. “Ukulele in Music Class: Teachers’ Perspectives.” *Visions of Research in Music Education* 38, no. 2 (2021): 1-28.

Evans, Paul, and Arielle Bonneville-Roussy. “Self-Determined Motivation for Practice in University Music Students.” *Psychology of Music* 44, no. 5 (2016): 1095-1110.

Feraco, Tommaso, Dario Resnati, Davide Fregonese, Andrea Spoto, and Chiara Meneghetti. “Soft Skills and Extracurricular Activities Sustain Motivation and Self-Regulated Learning at School.” *The Journal of Experimental Education* 90, no. 3 (2022): 550-569.

Finch, Holmes. “Comparison of the Performance of Nonparametric and Parametric MANOVA Test Statistics when Assumptions are Violated.” *Methodology* 1, no. 1 (2005): 27-38.

Giddings, Steve. “Let’s Play it by Ear: Leading a Jam Session with Your Learners.” *Canadian Music Educator* 60, no. 2 (2019): 34-36.

Giebelhausen, Robin. “So, You’re Thinking About Starting a Ukulele Program?” *General Music Today* 29, no. 3 (2016): 38-41.

Gilbert, Kris, Scott Burstein, Spencer Hale, Mary Claxton, and David Wish. *Modern Band Method: Ukulele Book 1*. Milwaukee, WI: Hal Leonard Publishing, 2023.

Giotta, Kelsey Kordella. “Trading My Baton for a Ukulele.” In *Narratives and Reflections in Music Education: Listening to Voices Seldom Heard*, edited by Tawnya D. Smith and Karin S. Hendricks, 65-76. Cham, Switzerland: Springer, 2020.

Gray, Luke. “Constructivist Approaches in the Music Classroom: The Orff Schulwerk Approach as a Student Centered Constructivist Pedagogy.” *Musicworks: Journal of the Australian Council of Orff Schulwerk* 23 (2018): 8-13.

Green, Lucy. “The Music Curriculum as Lived Experience: Children’s “Natural” Music-Learning Processes.” *Music Educators Journal* 91, no. 4 (2005): 27-32.

Greenberg, Marvin. “The Ukulele in Your Classroom.” *Music Educators Journal* 79, no. 3 (1992): 43-48.

Gruenhagen, Lisa M. “Developing Musical Creativity through Reflective and Collaborative Practices.” *Music Educators Journal* 103, no. 3 (2017): 40-45.

Hadjikou, Chryso. “Students’ Motivation to Engage in Music Lessons: The Cypriot Context.” *Research Studies in Music Education* 44, no. 2 (2022): 413-431.

Hallam, Susan, Andrea Creech, and Hilary McQueen. “What Impact Does Teaching Music Informally in the Classroom Have on Teachers, and Their Pedagogy?” *Music Education Research* 19, no. 1 (2017): 42-59.

Harrington, Ann M. “Aspects of Ensemble Participation and Feelings of Belonging Among New Horizons Members.” *Contributions to Music Education* 46 (2021): 19-34.

Harris, Maureen. “The Effects of Music Instruction on Learning in the Montessori Classroom.” *Montessori Life* 20, no. 3 (2008): 24-31.

Hess, Juliet. “Finding the ‘both/and’: Balancing Informal and Formal Music Learning.” *International Journal of Music Education* 38, no. 3 (2020): 441-455.

Hewitt, Donna. “Constructing Informal Experiences in the Elementary General Music Classroom.” *Music Educators Journal* 104, no. 3 (2018): 46-53.

Hewitt, Michael P. “The Impact of Self-Evaluation Instruction on Student Self-Evaluation, Music Performance, and Self-Evaluation Accuracy.” *Journal of Research in Music Education* 59, no. 1 (2011): 6-20.

Hill, James, and J. Chalmers Doane. *You Can Play Ukulele Today!* Brookfield, NS, Canada: Crystal Lake Media, 2009.

Illinois Report Card. “Montessori Elementary School.” Accessed June 5, 2023. https://www.illinoisreportcard.com/School.aspx?source=studentcharacteristics&source2=iep&Schoolid=041012050252085.

Illinois Report Card. “Rockford SD 205.” Accessed July 13, 2023. https://www.illinoisreportcard.com/district.aspx?source=studentcharacteristics&source2=enrollmentbygrades&Districtid=04101205025.

“Intrinsic Motivation Inventory (IMI).” Accessed July 24, 2023. https://selfdeterminationtheory.org/intrinsic-motivation-inventory/.

Ismail, Md Jais, Azu Farhana Anuar, and Fung Chiat Loo. “From Physical to Virtual: A New Learning Norm in Music Education for Gifted Students.” *International Review of Research in Open and Distributed Learning* 23, no. 2 (2022): 44-62.

Jacob, Cynthia, Christine Guptill, and Thelma Sumsion. “Motivation for Continuing Involvement in a Leisure-Based Choir: The Lived Experiences of University Choir Members.” *Journal of Occupational Science* 16, no. 3 (2009): 187-193.

Jaffurs, Sheri E. “The Impact of Informal Music Learning Practices in the Classroom, or How I Learned How to Teach from a Garage Band.” *International Journal of Music Education* 22, no. 3 (2004): 189-200.

Kamii, Constance, and Janice K. Ewing. “Basing Teaching on Piaget’s Constructivism.” *Childhood Education* 72, no. 5 (1996): 260-264.

Kasten, Wendy C. “Why Does Multiage Make Sense? Compelling Arguments for Educational Change.” *Primary Voices K-6* 6, no. 2 (1998): 2-9.

Kladder, Jonathan. “Songwriting in Modern Band?: Considering Constructivism as an Approach for Teaching Popular Music.” *College Music Symposium* 60, no. 2 (2020): 1-22.

Kratus, John. “Music Education at the Tipping Point.” *Music Educators Journal* 94, no. 2 (2007): 42-48.

Kruse, Nathan B. “‘Without U, it’s just Kulele’: Expressions of Leisure and ‘Ohana in an Intergenerational Music Club." *International Journal of Community Music* 6, no. 2 (2013): 153-167.

“Laerd Statistics.” Assumptions I. Accessed November 23, 2023. https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss-5.php

“Laerd Statistics.” Assumptions II. Accessed December 12, 2023. https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss-14.php.

“Laerd Statistics.” One-Way Manova in SPSS Statistics. Accessed November 23, 2023. https://statistics.laerd.com/premium/spss/owm/one-way-manova-in-spss.php.

“Liberty University.” Institutional Review Board. Accessed June 19, 2023. https://www.liberty.edu/graduate/institutional-review-board/.

Likesas, G., and E. Zachopoulou. “Music and Movement Education as a Form of Motivation in Teaching Greek Traditional Dances.” *Perceptual and Motor Skills* 102, no. 2 (2006): 552-562.

Lin, Cynthia. “Cynthia Lin Music.” Accessed April 20, 2023. YouTube Channel, www.youtube.com/cynthialinmusic.

López-Martinez, Ana, Lourdes Meroño, María Cánovas-López, Antonio García-de-Alcaraz, and Luis Manuel Martínez-Aranda. “Using Gamified Strategies in Higher Education: Relationship between Intrinsic Motivation and Contextual Variables.” *Sustainability* 14, no. 17 (2022): 1-14.

Mandigo, James, Nicholas Holt, Andy Anderson, and Joanna Sheppard. “Children’s Motivational Experiences Following Autonomy-Supportive Games Lessons.” *European Physical Education Review* 14, no. 3 (2008): 407-425.

“Mayo Foundation for Medical Education and Research.” Parametric and Nonparametric: Demystifying the Terms. Accessed January 11, 2024. https://www.google.com/search?q=mayo+education+parametric+versus+nonparametric&oq=mayo+education+parametric+versus+nonparametric&aqs=chrome..69i57j33i160l2.4517j0j7&sourceid=chrome&ie=UTF-8.

McAuley, Edward, Terry Duncan, and Vance V. Tammen. “Psychometric Properties of the Intrinsic Motivation Inventory in a Competitive Sport Setting: A Confirmatory Factor Analysis.” *Research Quarterly for Exercise and Sport* 60, no. 1 (1989): 48-58.

Mega, Carolina, Lucia Ronconi, and Rossana De Beni. “What Makes a Good Student? How Emotions, Self-Regulated Learning, and Motivation Contribute to Academic Achievement.” *Journal of Educational Psychology* 106, no. 1 (2014): 121-131.

Mehraban, Javad. “The Effect of Music Education on Students’ Psychological Well-Being.” *Management and Educational Perspective* 1, no. 2 (2020), 1-13.

Monteiro, Vera, Lourdes Mata, and Francisco Peixoto. “Intrinsic Motivation Inventory: Psychometric Properties in the Context of First Language and Mathematics Learning.” *Psychology* 28, no. 3 (2015): 434-443.

Montessori, Maria. *The Absorbent Mind*. New York: NY: Henry Holt, 1995.

Montessori, Maria. *The Montessori Method: The Book that Introduced Montessori to America*. New York, NY: Schocken Books Inc., 1964.

Morgan, Susan E., Tom Reichert, and Tyler R. Harrison. *From Numbers to Words: Reporting Statistical Results for the Social Sciences*. New York: Routledge, 2017.

Morrison, Sarah. “Popular Music in the Classroom: Where to Begin?” *Canadian Music Educator* 49, no. 2 (2007): 53-54.

“Music Will (Formerly known as Little Kids Rock).” Accessed April 15, 2023. Musicwill.org.

O’Leary, Emmett James. “The Ukulele and YouTube: A Content Analysis of Seven Prominent YouTube Ukulele Channels.” *Journal of Popular Music Education* 4, no. 2 (2020): 175-191.

Oliveira, António, Gary E. McPherson, Luísa Mota Ribeiro, and Patrícia Oliveira-Silva. “Can Motivation and Intentions of Parental Support Predict Musical Achievement Before the Commencement of Musical Studies at the Elementary School Level?” *International Journal of Music Education* 42, no. 1 (2023): 17-31.

Pendergast, Seth, and Nicole R. Robinson. “Secondary Students’ Preferences for Various Learning Conditions and Music Courses: A Comparison of School Music, Out-of-School Music, and Nonmusic Participants.” *Journal of Research in Music Education* 68, no. 3 (2020): 264-285.

“Piaget’s Theory of Constructivism.” Teach-Nology. Accessed June 1, 2023. https://www.teach-nology.com/currenttrends/constructivism/piaget/#:~:text=Piaget's%20theory%20of%20constructivism%20argues,teaching%20methods%2C%20and%20education%20reform.

Pino, Dorothy. “Color-Coding for Confident Chording.” *School Band and Orchestra* 25, no. 5 (2022): 24.

“Quaver Music.” Accessed April 15, 2023. Quavered.com.

Raeburn, Susan D., John Hipple, William Delaney, and Kris Chesky. “Surveying Popular Musicians’ Health Status Using Convenience Samples.” *Science & Medicine, Inc.* 18, no. 3 (2003): 113-119.

Ranse, Jamie, Paul Arbon, Lynette Cusack, Ramon Z. Shaban, and Daniel Nicholls. “Obtaining Individual Narratives and Moving to an Intersubjective Lived-Experience Description: A Way of Doing Phenomenology.” *Qualitative Research* 20, no. 6 (2020): 945-959.

Reeder, Adam. “The Best Ukulele.” *Best Reviews* (2019): 1-5.

Reese, Jill Alyse. “Uke, Flow, and Rock ‘n’ Roll.” *International Journal of Community Music* 12, no. 2 (2019): 207-227.

Roberts, Carol, and Laura Hyatt. *The Dissertation Journey: A Practical and Comprehensive Guide to Planning, Writing, and Defending Your Dissertation*. Thousand Oaks, CA: Corwin, 2019.

Robison, Tiger. “Classroom Management Through Student Choice and Democratic Practices: Part I.” *General Music Today* 34, no. 2 (2021): 31-33.

Ryan, Richard M. and Edward L. Deci. *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. New York: The Guilford Press, 2017.

Salvador, Karen. “Assessment and Individualized Instruction in Elementary General Music: A Case Study.” *Research Studies in Music Education* 41, no. 1 (2019): 18-42.

Schatt, Matthew D. “The Music Practice Motivation Scale: An Exploration of Secondary Instrumental Music Students’ Motivation to Practice.” *International Journal of Music Education* 41, no. 1 (2023): 157-171.

Schmidt, Charles. “Relations Among Motivation, Performance Achievement, and Music Experience Variables in Secondary Instrumental Music Students.” *Journal of Research in Music Education* 53, no. 2 (2005): 134-147.

Schmitt, Cecelia. “The Thought-Life of Young Child: Jean Piaget and the Teaching of Music.” *Music Educators Journal* 58, no. 4 (1971): 22-26.

Scott, Sheila. “Contemplating a Constructivist Stance for Active Learning within Music Education.” *Arts Education Policy Review* 112, no. 4 (2011): 191-198.

Sharp, Laurie A., and Ali Tiegs. “Impact of WOWW’s Fine Arts Enriched Education Programming.” *International Journal of Instruction* 11, no. 2 (2018): 25-40.

Shively, Joseph. “Constructivism in Music Education.” *Arts Education Policy Review* 116, no. 3 (2015): 128-136.

Small, Christopher. *Musicking: The Meanings of Performing and Listening*. Middletown, CT: Wesleyan University Press, 1998.

Smith, Raychl, and Jacqueline Secoy. “Exploring the Music Identity Development of Elementary Education Majors Using Ukulele and YouTube.” *Journal of Music Teacher Education* 29, no. 1 (2019): 71-85.

Springer, D. Gregory. “Teaching Popular Music: Investigating Music Educators’ Perceptions and Preparation.” *International Journal of Music Education* 34, no. 4 (2016): 403-415.

Standerfer, Stephanie L. “Differentiation in the Music Classroom.” *Music Educators Journal* 97, no. 4 (2011): 43-47.

Stuart, Shannon K., Mary Connor, Karin Cady, and Alicia Zweifel. “Multiage Instruction and Inclusion: A Collaborative Approach.” *International Journal of Whole Schooling* 3, no. 1 (2006): 12-26.

Tamberino, Philip. *Uke Can Do It!: Developing Your School Ukulele Program*. Lanham, MD: Rowman & Littlefield, 2014.

Thibeault, Matthew D., and Julianne Evoy. “Building Your Own Musical Community: How YouTube, Miley Cyrus, and the Ukulele Can Create a New Kind of Ensemble.” *General Music Today* 24, no. 3 (2011): 44-52.

Thibeault, Matthew D. “Music Education for All Through Participatory Ensembles.” *Music Educators Journal* 102, no. 2 (2015): 54-61.

Tomich, Shelley. *Rainbow Ukulele*. Pitch Publications, 2016.

“Transpose.” Accessed October 5, 2023. https://transpose.video.

"Ukulele Go." 32 Ukulele Strumming Patterns. Accessed October 4, 2023. https://ukulelego.com/stuff/32-ukulele-strumming-patterns/.

Ulger, Kani. "Comparing the Effects of Art Education and Science Education on Creative Thinking in High School Students." *Arts Education Policy Review* 120, no. 2 (2019): 52-79.

Valle, Christopher, Heidi Andrade, Maria Palma, and Joanna Hefferen. "Applications of Peer Assessment and Self-Assessment in Music." *Music Educators Journal* 102, no. 4 (2016): 41-49.

Vinnard, Valerie. "The Classroom Drum Circle Project: Creating Innovative Differentiation in Music Education." *Delta Kappa Gamma Bulletin* 85, no. 2 (2018): 43-46.

Vygotsky, L.S. *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press, 1978.

Wang, Jui-Ching, and Jere T. Humphreys. "Multicultural and Popular Music Content in an American Music Teacher Education Program." *International Journal of Music Education* 27, no. 1 (2009): 19-36.

Webb, Phyllis, Scott Emmerman, Mike Upton, Jim Beloff, Brian Vance, Ron Van Ostenbridge, Ron Manus et al. "Ukulele Surge: Finally Some Respect?" *Musical Merchandise Review* 168, no. 10 (2009): 46-49, 52-54.

Welby, Rachel. "Ukulaliens Ukulele Club." Accessed April 20, 2023. YouTube Channel, www.youtube.com/@Ukulaliens/featured.

"What is Constructivism?" Western Governors University. Accessed April 6, 2023. https://www.wgu.edu/blog/what-constructivism2005.html.

Wiggins, Jackie. "Constructivism, Policy, and Arts Education." *Arts Education Policy Review* 116, no. 3 (2015): 115-117.

Wong, Bing Sum, Kah Loong Chue, Rosmawati Bte Ali, and Prisca Lee. "Differentiated Instruction: A Comparison of Motivation and Perceived Competence Between Students with High and Low Readiness Levels." *Educational Research for Policy and Practice* 22, no. 1 (2023): 139-151.

Woody, Robert H. "Music Education Students' Intrinsic and Extrinsic Motivation: A Quantitative Analysis of Personal Narratives." *Psychology of Music* 49, no. 5 (2021): 1321-1343.

Appendix A – Intrinsic Motivation Inventory (IMI)

Intrinsic Motivation Inventory (IMI)

Scale Description

The Intrinsic Motivation Inventory (IMI) is a multidimensional measurement device intended to assess participants subjective experience related to a target activity in laboratory experiments. It has been used in several experiments related to intrinsic motivation and self-regulation (e.g., Ryan, 1982; Ryan, Mims & Koestner, 1983; Plant & Ryan, 1985; Ryan, Connell, & Plant, 1990; Ryan, Koestner & Deci, 1991; Deci, Eghrari, Patrick, & Leone, 1994). The instrument assesses participants interest/enjoyment, perceived competence, effort, value/usefulness, felt pressure and tension, and perceived choice while performing a given activity, thus yielding six subscale scores. Recently, a seventh subscale has been added to tap the experiences of relatedness, although the validity of this subscale has yet to be established. The **interest/enjoyment subscale is considered the self-report measure of intrinsic motivation**; thus, although the overall questionnaire is called the Intrinsic Motivation Inventory, it is only the one subscale that assesses intrinsic motivation, per se. As a result, the interest/enjoyment subscale often has more items on it that do the other subscales. The perceived choice and perceived competence concepts are theorized to be positive predictors of both self-report and behavioral measures of intrinsic motivation, and pressure/tension is theorized to be a negative predictor of intrinsic motivation. Effort is a separate variable that is relevant to some motivation questions, so is used it its relevant. The value/usefulness subscale is used in internalization studies (e.g., Deci et al, 1994), the idea being that people internalize and become self-regulating with respect to activities that they experience as useful or valuable for themselves. Finally, the relatedness subscale is used in studies having to do with interpersonal interactions, friendship formation, and so on.

The IMI consists of varied numbers of items from these subscales, all of which have been shown to be factor analytically coherent and stable across a variety of tasks, conditions, and settings. The general criteria for inclusion of items on subscales have been a factor loading of at least 0.6 on the appropriate subscale, and no cross loadings above 0.4. Typically, loadings substantially exceed these criteria. Nonetheless, we recommend that investigators perform their own factor analyses on new data sets. Past research suggests that order effects of item presentation appear to be negligible, and the inclusion or exclusion of specific subscales appears to have no impact on the others. Thus, it is rare that all items have been used in a particular experiment. Instead, experimenters have chosen the subscales that are relevant to the issues they are exploring.

The IMI items have often been modified slightly to fit specific activities. Thus, for example, an item such as I tried very hard to do well at this activity can be changed to I tried very hard to do well on these puzzles or ...in learning this material without effecting its reliability or validity. As one can readily tell, there is nothing subtle about these items; they are quite face-valid. However, in part, because of their straightforward nature, caution is needed in interpretation. We have found, for example, that correlations between self-reports of effort or interest and behavioral indices of these dimensions are quite modest--often around 0.4. Like other self-report measures,

there is always the need to appropriately interpret how and why participants report as they do. Ego- involvements, self-presentation styles, reactance, and other psychological dynamics must be considered. For example, in a study by Ryan, Koestner, and Deci (1991), we found that when participants were ego involved, the engaged in pressured persistence during a free choice period and this behavior did not correlate with the

self-reports of interest/enjoyment. In fact, we concluded that to be confident in one's assessment of intrinsic motivation, one needs to find that the free-choice behavior and the self-reports of interest/enjoyment are significantly correlated.

Another issue is that of redundancy. Items within the subscales overlap considerably, although randomizing their presentation makes this less salient to most participants. Nonetheless, shorter versions have been used and been found to be quite reliable. The incremental R for every item above 4 for any given factor is quite small. Still, it is very important to recognize that multiple item subscales consistently outperform single items for obvious reasons, and they have better external validity.

On The Scale page, there are five sections. First, the full 45 items that make up the 7 subscales are shown, along with information on constructing your own IMI and scoring it. Then, there are four specific versions of the IMI that have been used in past studies. This should give you a sense of the different ways it has been used. These have different numbers of items and different numbers of subscales, and they concern different activities. First, there is a standard, 22-item version that has been used in several studies, with four subscales: interest/ enjoyment, perceived competence, perceived choice, and pressure/tension. Second, there is a short 9-item version concerned with the activity of reading some text material; it has three subscales: interest/enjoyment, perceived competence, and pressure/tension. Then, there is the 25-item version that was used in the internalization study, including the three subscales of value/usefulness, interest/enjoyment, and perceived choice. Finally, there is a 29-item version of the interpersonal relatedness questionnaire that has five subscales: relatedness, interest/enjoyment, perceived choice, pressure/tension, and effort.

Finally, McAuley, Duncan, and Tammen (1987) did a study to examine the validity of the IMI and found strong support for its validity.

References

Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, *62*, 119-142.

McAuley, E., Duncan, T., & Tammen, V. V. (1987). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 60,* 48-58.

Plant, R. W., & Ryan, R. M. (1985). Intrinsic motivation and the effects of self-consciousness, self- awareness, and ego-involvement: An investigation of internally-controlling styles. *Journal of Personality*, *53*, 435-449.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43*, 450-461.

Ryan, R. M., Connell, J. P., & Plant, R. W. (1990). Emotions in non-directed text learning. *Learning and Individual Differences*, *2*, 1-17.

Ryan, R. M., Koestner, R., & Deci, E. L. (1991). Varied forms of persistence: When free-choice behavior is not intrinsically motivated. *Motivation and Emotion*, *15*, 185-205.

Ryan, R. M., Mims, V., & Koestner, R. (1983). Relation of reward contingency and interpersonal context to intrinsic motivation: A review and test using cognitive evaluation theory. *Journal of Personality and Social Psychology*, *45*, 736-750.

The Scales

THE POST-EXPERIMENTAL INTRINSIC MOTIVATION INVENTORY (Below are listed all 45 items that can be used depending on which are needed.)

For each of the following statements, please indicate how true it is for you, using the following scale: 1234567

not at all somewhat true true very true

Interest/Enjoyment

I enjoyed doing this activity very much
This activity was fun to do.
I thought this was a boring activity. (R)
This activity did not hold my attention at all. (R)
I would describe this activity as very interesting.
I thought this activity was quite enjoyable.
While I was doing this activity, I was thinking about how much I enjoyed it.

Perceived Competence

I think I am pretty good at this activity.
I think I did pretty well at this activity, compared to other students.

After working at this activity for awhile, I felt pretty competent.
I am satisfied with my performance at this task.
I was pretty skilled at this activity.
This was an activity that I couldn't do very well. (R)

Effort/Importance

I put a lot of effort into this.
I didn't try very hard to do well at this activity. (R)

I tried very hard on this activity.
It was important to me to do well at this task.

I didn't put much energy into this. (R)

Pressure/Tension

I did not feel nervous at all while doing this. (R)

I felt very tense while doing this activity.
I was very relaxed in doing these. (R)
I was anxious while working on this task.

I felt pressured while doing these.

Perceived Choice

I believe I had some choice about doing this activity.
I felt like it was not my own choice to do this task. (R)

I didn't really have a choice about doing this task. (R)

I felt like I had to do this. (R)
I did this activity because I had no choice. (R)
I did this activity because I wanted to.
I did this activity because I had to. (R)

Value/Usefulness

I believe this activity could be of some value to me.
I think that doing this activity is useful for _____

I think this is important to do because it can _____

I would be willing to do this again because it has some value to me.
I think doing this activity could help me to _____

I believe doing this activity could be beneficial to me.
I think this is an important activity.

Relatedness

I felt really distant to this person. (R)
I really doubt that this person and I would ever be friends. (R)
I felt like I could really trust this person.
I'd like a chance to interact with this person more often.
I'd really prefer not to interact with this person in the future. (R)
I don't feel like I could really trust this person. (R)
It is likely that this person and I could become friends if we interacted a lot.

I feel close to this person.

Constructing the IMI for your study. First, decide which of the variables (factors) you want to use, based on what theoretical questions you are addressing. Then, use the items from those factors, randomly ordered. If you use the value/usefulness items, you will need to complete the three items as appropriate. In other words, if you were studying whether the person believes an activity is useful for improving concentration, or becoming a

better basketball player, or whatever, then fill in the blanks with that information. If you do not want to refer to a particular outcome, then just truncate the items with its being useful, helpful, or important.

Scoring information for the IMI. To score this instrument, you must first reverse score the items for which an (R) is shown after them. To do that, subtract the item response from 8, and use the resulting number as the item score. Then, calculate subscale scores by averaging across all of the items on that subscale. The subscale scores are then used in the analyses of relevant questions.

* **********

The following is a 22 item version of the scale that has been used in some lab studies on intrinsic motivation. It has four subscales: interest/enjoyment, perceived choice, perceived competence, and pressure/tension. The interest/enjoyment subscale is considered the self-report measure of intrinsic motivation; perceived choice and perceived competence are theorized to be positive predictors of both self-report and behavioral measures of intrinsic motivation. Pressure tension is theorized to be a negative predictor of intrinsic motivation. Scoring information is presented after the questionnaire itself.

TASK EVALUATION QUESTIONNAIRE

For each of the following statements, please indicate how true it is for you, using the following scale:

1234567 not at all somewhat very

true true true

1. While I was working on the task I was thinking about how much I enjoyed it.

2. I did not feel at all nervous about doing the task.
3. I felt that it was my choice to do the task.
4. I think I am pretty good at this task.
5. I found the task very interesting.
6. I felt tense while doing the task.
7. I think I did pretty well at this activity, compared to other students.

8. Doing the task was fun.
9. I felt relaxed while doing the task.
10. I enjoyed doing the task very much.
11. I didn't really have a choice about doing the task.
12. I am satisfied with my performance at this task.
13. I was anxious while doing the task.
14. I thought the task was very boring.
15. I felt like I was doing what I wanted to do while I was working on the task.
16. I felt pretty skilled at this task.
17. I thought the task was very interesting.
18. I felt pressured while doing the task.
19. I felt like I had to do the task.
20. I would describe the task as very enjoyable.
21. I did the task because I had no choice.
22. After working at this task for awhile, I felt pretty competent.

Scoring information. Begin by reverse scoring items # 2, 9, 11, 14, 19, 21. In other words, subtract the item response from 8, and use the result as the item score for that item. This way, a higher score will indicate more of the concept described in the subscale name. Thus, a higher score on pressure/tension means the person felt more pressured and tense; a higher score on perceived competence means the person felt more competent; and so on. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are as follows. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Interest/enjoyment: 1, 5, 8, 10, 14(R), 17, 20 Perceived competence: 4, 7, 12, 16, 22 Perceived choice: 3, 11(R), 15, 19(R), 21(R) Pressure/tension: 2(R), 6, 9(R), 13, 18

The subscale scores can then be used as dependent variables, predictors, or mediators, depending on the research questions being addressed.

* **********

TEXT MATERIAL QUESTIONNAIRE I

For each of the following statements, please indicate how true it is for your, using the following scale as a guide:

not at all somewhat true true

very true

1234567

1. While I was reading this material, I was thinking about how much I enjoyed it.
2. I did not feel at all nervous while reading.
3. This material did not hold my attention at all.
4. I think I understood this material pretty well.
5. I would describe this material as very interesting.
6. I think I understood this material very well, compared to other students.
7. I enjoyed reading this material very much.
8. I felt very tense while reading this material.
9. This material was fun to read.

Scoring information. Begin by reverse scoring items # 2 and 3. In other words, subtract the item response from 8, and use the result as the item score for that item. This way, a higher score will indicate more of the

concept described in the subscale name. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are shown below. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Interest/enjoyment: 1, 3(R), 5, 7, 9 Perceived competence: 4, 6, Pressure/tension: 2(R), 8

* **********

The next version of the questionnaire was used for a study of internalization with an uninteresting computer task (Deci et al., 1994).

ACTIVITY PERCEPTION QUESTIONNAIRE

The following items concern your experience with the task. Please answer all items. For each item, please indicate how true the statement is for you, using the following scale as a guide:

1234567 not at all somewhat very

true true true

1. I believe that doing this activity could be of some value for me.
2. I believe I had some choice about doing this activity.
3. While I was doing this activity, I was thinking about how much I enjoyed it.
4. I believe that doing this activity is useful for improved concentration.
5. This activity was fun to do.
6. I think this activity is important for my improvement.
7. I enjoyed doing this activity very much.
8. I really did not have a choice about doing this activity.

9. I did this activity because I wanted to.
10. I think this is an important activity.
11. I felt like I was enjoying the activity while I was doing it.
12. I thought this was a very boring activity.
13. It is possible that this activity could improve my studying habits.
14. I felt like I had no choice but to do this activity.
15. I thought this was a very interesting activity.
16. I am willing to do this activity again because I think it is somewhat useful.
17. I would describe this activity as very enjoyable.
18. I felt like I had to do this activity.
19. I believe doing this activity could be somewhat beneficial for me.
20. I did this activity because I had to.
21. I believe doing this activity could help me do better in school.
22. While doing this activity I felt like I had a choice.
23. I would describe this activity as very fun.
24. I felt like it was not my own choice to do this activity.
25. I would be willing to do this activity again because it has some value for me.

Scoring information. Begin by reverse scoring items # 8, 12, 14, 18, 20, and 24 by subtracting the item response from 8 and using the result as the item score for that item. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are shown below. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Interest/enjoyment: Value/usefulness: Perceived choice:

3, 5, 7, 11, 12(R), 15, 17, 23
1, 4, 6, 10, 13, 16, 19, 21, 25
2, 8(R), 9, 14(R), 18(R), 20(R), 22, 24(R)

* **********

SUBJECT IMPRESSIONS QUESTIONNAIRE

The following sentences describe thoughts and feelings you may have had regarding the other person who participated in the experiment with you. For each of the following statement please indicate how true it is for you, using the following scale as a guide:

1234567 not at all somewhat very

true true true

1. While I was interacting with this person, I was thinking about how much I enjoyed it.
2. I felt really distant to this person.
3. I did not feel at all nervous about interacting with this person.
4. I felt like I had choice about interacting with this person.

5. I would describe interacting with this person as very enjoyable.
6. I really doubt that this person and I would ever become friends.
7. I found this person very interesting.
8. I enjoyed interacting with this person very much.
9. I felt tense while interacting with this person.
10. I really feel like I could trust this person.
11. Interacting with this person was fun.
12. I felt relaxed while interacting with this person.
13. I'd like a chance to interact more with this person.

14. I didn't really have a choice about interacting with this person.
15. I tried hard to have a good interaction with this person.
16. I'd really prefer not to interact with this person in the future.
17. I was anxious while interacting with this person.
18. I thought this person was very boring.
19. I felt like I was doing what I wanted to do while I was interacting with this person.
20. I tried very hard while interacting with this person.
21. I don't feel like I could really trust this person.
22. I thought interacting with this person was very interesting.
23. I felt pressured while interacting with this person.
24. I think it's likely that this person and I could become friends.
25. I felt like I had to interact with this person.
26. I feel really close to this person.
27. I didn't put much energy into interacting with this person.
28. I interacted with this person because I had no choice.
29. I put some effort into interacting with this person.

Scoring information. Begin by reverse scoring items # 2, 3, 6, 12, 14, 16, 18, 21, 25, 27, and 28 by subtracting the item response from 8 and using the result as the item score for that item. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are shown below. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Relatedness: Interest/enjoyment: Perceived choice: Pressure/tension: Effort:

2(R), 6(R), 10, 13, 16(R), 21(R), 24, 26 1, 5, 7, 8, 11, 18(R), 22
4, 14(R), 19, 25(R), 28(R)
3(R), 9, 12(R), 17, 23,

15, 20, 27(R), 29

Appendix B – Adapted IMI

Adapted 22 Item IMI

1. While I was learning the ukulele, I was thinking about how much I enjoyed it.

2. I did not feel at all nervous about learning the ukulele.
3. I felt that it was my choice to learn the ukulele.
4. I think I am pretty good at learning the ukulele.
5. I found learning the ukulele very interesting.
6. I felt tense while learning the ukulele.
7. I think I did pretty well at learning the ukulele, compared to other students.
8. Learning the ukulele was fun.
9. I felt relaxed while learning the ukulele.
10. I enjoyed learning the ukulele very much.
11. I didn't really have a choice about learning the ukulele.
12. I am satisfied with my performance on the ukulele.
13. I was anxious while learning the ukulele.
14. I thought learning the ukulele was very boring.
15. I felt like I was doing what I wanted to do while I was learning the ukulele.
16. I felt pretty skilled at the ukulele.
17. I thought learning the ukulele was very interesting.
18. I felt pressured while learning the ukulele.
19. I felt like I had to learn the ukulele.
20. I would describe learning the ukulele as very enjoyable.
21. I learned the ukulele because I had no choice.
22. After working at learning the ukulele for a while, I felt pretty competent.

Appendix C – IRB Approval

October 10, 2023

Jill Moth
Nathan Street

Re: IRB Exemption - IRB-FY23-24-356 A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom

Dear Jill Moth, Nathan Street,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents can also be found on the same page under the Attachments tab.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at

Sincerely,
G. Michele Baker, PhD, CIP
Administrative Chair
Research Ethics Office

Appendix D – Approval from School's Principal

August 26, 2023

Mrs. Candice Collins
Principal
Maria Montessori School

Dear Mrs. Collins,

As a graduate student in the School of Music at Liberty University, I am conducting research as part of the requirements for a Ph.D. degree. The title of my research project is "A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom." The purpose of my research study is to investigate students' perspectives on motivation while learning the ukulele in the mixed-age general music classroom after receiving either the Quaver Music curriculum or the Music Will curriculum.

I am writing to request your permission to conduct my research at Maria Montessori School.

Participants will be asked to complete the attached survey via their Chromebook after receiving ukulele instruction. Participants will be presented with informed consent information prior to child. Taking part in this study is completely voluntary, and participants are welcome to discontinue participation at any time.

Thank you for considering my request. If you choose to grant permission, please provide a signed statement on official letterhead indicating your approval. A permission letter document is attached for your convenience.

Sincerely,

Jill K. Moth
Ph.D. Student, Liberty University

MARIA MONTESSORI

August 28, 2023

Jill Moth
Maria Montessori School

Dear Jill K. Moth,

After careful review of your research proposal entitled "A Comparison of Student Motivation Between Two Ukulele Curricula in a Mixed-Age Classroom," I have decided to grant you permission to conduct your study at Maria Montessori School.

Check the following boxes, as applicable:

☒ I grant permission for Jill K. Moth to contact E2 students' parents to invite them to opt-out of her research study.

I am requesting a copy of the results upon study completion and/or publication.

Sincerely,

Mrs. Candice Collins
Principal

Appendix E – Parental Opt-Out Form for Research Study

Parental Opt-Out

Title of the Project: "A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom"

Principal Investigator: Jill K. Moth, Doctoral Candidate, Liberty University School of Music

Invitation to be Part of a Research Study

Your child is invited to participate in a research study. To participate, he or she must be a student in fourth through sixth-grade at Maria Montessori School in RPS205 in Rockford, IL. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to allow your child to take part in this research project.

What is the study about and why are we doing it?

The purpose of the study is to investigate students' perspectives on their motivation while learning the ukulele in the multi-age general music classroom.

What will participants be asked to do in this study?

If you agree to allow your child to be in this study, I will ask him or her to do the following:

1. First task – All students will receive six weeks of ukulele instruction in the general music classroom as part of their music curriculum.
2. Second task - Complete an anonymous Google survey during the unit. This should take approximately 5 minutes.

How could participants or others benefit from this study?

Direct Benefits: The direct benefit participants should expect to receive from taking part in this study is learning the ukulele by using a variety of strategies.

Benefits to society include helping contribute to the body of research on teaching ukulele by providing students' perspectives on various learning methods. This could be useful to other music teachers.

What risks might participants experience from being in this study?

Minimal risk: The expected risks from participating in this study are minimal, which means they are equal to the risks your child would encounter in everyday life.

I am a mandatory reporter. During this study, if I receive information about child abuse, child neglect, elder abuse, or intent to harm self or others, I will be required to report it to the appropriate authorities.

How will personal information be protected?

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be anonymous.
- Data will be stored on a password-locked computer. After five years, all electronic records will be deleted and all hardcopy records will be shredded.

How will participants be compensated for being part of the study?

Participants will not be compensated for participating in this study. The Google survey will be counted as a classroom/reflection assignment.

Is the researcher in a position of authority over participants, or does the researcher have a financial conflict of interest?

The researcher serves as a teacher at Maria Montessori School. To limit potential or perceived conflicts, Google surveys will be anonymous, so the researcher will not know who participated. This disclosure is made so that you can decide if this relationship will affect your willingness to allow your child to participate in this study. No action will be taken against an individual based on her or his decision to allow his or her child to participate in this study.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to allow your child to participate will not affect your or his or her current or future relations with Liberty University. If you decide to allow your child to participate, he or she is free to not answer any question or withdraw at any time without affecting those relationships.

What should be done if a participant wishes to withdraw from the study?

If you choose to withdraw your child from the study or your child chooses to withdraw, please have him or her exit the survey and close his or her internet browser. Your child's responses will not be recorded or included in the study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Jill K. Moth. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [ ] You may also contact the researcher's faculty sponsor, Dr. Nathan Street at [ ]

Whom do you contact if you have questions about rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the IRB. Our physical address is [ ]

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Opt-Out

Parental Opt-Out: If you would prefer that your child NOT PARTICIPATE in this study, please sign this document, and return it to Jill K. Moth by November 1, 2023.

_____

Printed Child's/Student's Name

_____

Parent/Guardian's Signature Date

Appendix F – Child Assent Form for Research Study

Child Assent to Participate in a Research Study

What is the name of the study and who is doing the study?

The name of the study is "A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom," and the person doing the study is Jill K. Moth.

Why is Jill K. Moth doing this study?

Jill Moth wants to compare student motivation when experiencing ukulele instruction on one of two types of curricula.

Why am I being asked to be in this study?

You are being asked to be in this study because you are a fourth, fifth, or sixth-grade student at Maria Montessori who will be learning the ukulele in music class.

If I decide to be in the study, what will happen and how long will it take?

If you decide to be in this study, you will complete a five to ten-minute Google survey.

Do I have to be in this study?

No, you do not have to be in this study. If you want to be in this study, then tell the researcher. If you don't want to, it's OK to say no. The researcher will not be angry. You can say yes now and change your mind later. It's up to you.

What if I have a question?

You can ask questions anytime. You can ask now. You can ask later. You can talk to the researcher. If you do not understand something, please ask the researcher to explain it to you again.

Jill K. Moth

Dr. Nathan Street

Appendix G – Quaver Music and Music Will Curricula

These are the websites for the two curricula. Quaver Music is by subscription only. Music Will is free of cost.

Quaver Music:
https://docs.google.com/forms/d/19wS7TeTg9D4VJW_yysfE9zxb9Jcn6IKuVtCeUpm27r8/edit

Music Will:
https://jamzone.musicwill.org/lessons/?instrument=ukulele

Appendix H – Lesson Plans for Ukulele Unit

Quaver Education Ukulele Curriculum:
Week 1 - Class 1 – Introduction to the Ukulele Quaver video, parts of the ukulele, introduction to tuning and open strings, cool hand uke game, History of the Ukulele Quaver video

Week 1 - Class 2 - Review and open strings practice and tuning, ukulele breakdown on strings G, C, E, A and Ukulele Breakdown song that combines them – individual practice, small group practice, full group practice

Week 2 – Class 1 – Review open strings, finger combination game, Ukulele Scalee video, Layers song on C string and E string (only some did)

Week 2 – Class 2 – Review all above, Funky stuff game, funky stuff songs 1 and 2 (only some did), review open strings

Week 3 – Class 1 – Ukulele Chord Quaver video, Ukulele Shakee with C chord, Ukulele Shakee with F chord, Ukulele Shakee with G7 chord, Ukulele Shakee with C, F, and G7 chords

Week 3 – Class 2 – Review C, F, and G7 chords, and Ukulele Shakee, Learn Crazy Alien song with C and F chords, practice switches and add strum options (GIVE SURVEY)

Week 4 – Class 1 – Video of Jake Shimabukuro, review all above, Fly-ee to Hawaii chords C and F, Fly-ee to Hawaii chords C and G7, Fly-ee to Hawaii chords C, F, and G7, Fly-ee to Hawaii Animated score, Five Green and Speckled Frogs, introduce am, Can't Stop the Feeling, Lion Sleeps Tonight

Week 4 – Class 2 – Review all above as needed/catch-up, add punchcards for students to work independently

Week 5 – Class 1 – Video of Taimane Gardner, review all above, teach pentatonic scale, 12 bar blues, students improvise, punchcards

Week 5 – Class 2 – Video of bass ukulele, Lion Sleeps Tonight, Stand By Me, Rudoph, Last Christmas, punchcards

Week 6 – review all, students improvise blues solos, punchcards

Music Will Ukulele Curriculum

Week 1 - Class 1 – All about the ukulele video, open C chord, one-note solo, open strings

Week 1 - Class 2 – Review all above, add am chord, "Shout" by the Isley Brothers

Week 2 – Class 1 – Review all above plus new strumming patterns (quarter notes, upstrums)– individual practice, small-group practice, full-group practice, add F chord, "Can't Stop the Feeling" by Justin Timberlake playalong, "Wake me up" by Avicci playalong

Week 2 – Class 2 – review, C chord, am chord, F chord, "Can't Stop the Feeling" playalong, "Wake Me Up" playalong

Week 3 – Class 1 – Review C, am, and F chords, add "Uptown Funk" by Bruno Mars Riff page 37

Week 3 – Class 2 – Learn G7 chord, review all above – start "Save Your Tears" (GIVE SURVEY)

Week 4 – Class 1 – Video of Jake Shimabukuro, playalong tracks from JamZone – individual practice, small-group practice, and full-group practice – "Save Your Tears" by The Weekend

Week 4 – Class 2 – Review all above as needed/catch-up, add punchcards for students to work independently

Week 5 – Class 1 – Video of Taimane Gardner, review all above, teach pentatonic scale, 12 bar blues, students improvise, punchcards

Week 5 – Class 2 – Video of bass ukulele, Lion Sleeps Tonight, Stand By Me, Rudoph, Last Christmas, punchcards

Week 6 – review all, students improvise blues solos, punchcards

Appendix I – Parental Opt-Out Form for Pilot Study

Title of the Project: "A Comparison of Student Motivation Between Two Ukulele Curricula in a Multi-Age Classroom"

Principal Investigator: Jill K. Moth, Doctoral Candidate, Liberty University School of Music

Invitation to be Part of a Research Study

Your child is invited to participate in a pilot study. To participate, he or she must be a student in fourth through sixth-grade at Maria Montessori School in RPS205 in Rockford, IL. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to allow your child to take part in this research project.

What is the study about and why are we doing it?

The purpose of the study is to investigate students' perspectives on the wording of survey questions.

What will participants be asked to do in this study?

If you agree to allow your child to be in this study, I will ask him or her to do the following:

3. First task – Complete a sample Google Form survey
4. Second task - Give feedback to the music teacher/researcher about the survey items

How could participants or others benefit from this study?

Direct Benefits: The student will get practice taking a survey and reading each item.

Benefits to society include helping contribute to the validity of the ukulele study for which this pilot study is intended.

What risks might participants experience from being in this study?

Minimal risk: The expected risks from participating in this study are minimal, which means they are equal to the risks your child would encounter in everyday life.

I am a mandatory reporter. During this study, if I receive information about child abuse, child neglect, elder abuse, or intent to harm self or others, I will be required to report it to the appropriate authorities.

How will personal information be protected?

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be kept confidential by replacing names with pseudonyms.
- Interviews will be conducted in a location where others will not easily overhear the conversation.
- Data collected from your child may be used in future research studies and shared with other researchers. If data collected from your child is reused or shared, any information that could identify your child if applicable, will be removed beforehand.
- Data will be stored on a password-locked computer. After five years, all electronic records will be deleted and all hardcopy records will be shredded.
- Recordings will be stored on a password locked computer for five years and then deleted. The researcher and members of her doctoral committee will have access to these recordings.

How will participants be compensated for being part of the study?

Participants will not be compensated for participating in this study. The Google survey will be counted as a classroom/reflection assignment.

Is the researcher in a position of authority over participants, or does the researcher have a financial conflict of interest?

The researcher serves as a teacher at Maria Montessori School. To limit potential or perceived conflicts, Google surveys will be anonymous, so the researcher will not know who participated,

and your child's teacher will ensure that all data is stripped of identifiers before the researcher receives it. This disclosure is made so that you can decide if this relationship will affect your willingness to allow your child to participate in this study. No action will be taken against an individual based on her or his decision to allow his or her child to participate in this study.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to allow your child to participate will not affect your or his or her current or future relations with Liberty University. If you decide to allow your child to participate, he or she is free to not answer any question or withdraw at any time without affecting those relationships.

What should be done if a participant wishes to withdraw from the study?

Anonymous Survey Research: If you choose to withdraw your child from the study or your child chooses to withdraw, please have him or her exit the survey and close his or her internet browser. Your child's responses will not be recorded or included in the study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Jill K. Moth. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [redacted] You may also contact the researcher's faculty sponsor, Dr. Nathan Street at [redacted]

Whom do you contact if you have questions about rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the IRB. Our physical address is [redacted]

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Opt-Out

Parental Opt-Out: If you would prefer that your child NOT PARTICIPATE in this study, please sign this document, and return it to Jill K. Moth by October 20, 2023.

_____

Printed Child's/Student's Name

_____

Parent/Guardian's Signature Date

Appendix J – Child Assent Form for Pilot Study

What is the name of the study and who is doing the study?

This is a pilot study to test the wording of survey questions and students' understanding.

Why is Jill K. Moth doing this study?

Jill Moth wants to ensure that fourth through sixth-grade students understand and can complete survey questions.

Why am I being asked to be in this study?

You are being asked to be in this study because you are a fourth, fifth, or sixth-grade student at Maria Montessori.

If I decide to be in the study, what will happen and how long will it take?

If you decide to be in this study, you will complete a two to three-minute Google survey and answer questions.

Do I have to be in this study?

No, you do not have to be in this study. If you want to be in this study, then tell the researcher. If you don't want to, it's OK to say no. The researcher will not be angry. You can say yes now and change your mind later. It's up to you.

What if I have a question?

You can ask questions anytime. You can ask now. You can ask later. You can talk to the researcher. If you do not understand something, please ask the researcher to explain it to you again.

Signing your name below means that you want to be in the study.

_____

Signature of Child/Witness Date

Appendix K – Google Survey Items

The researcher has adapted these items to fit the needs of this study, based on the Intrinsic Motivation Inventory (IMI).

Adapted 22 Item IMI

1. While I was learning the ukulele, I was thinking about how much I enjoyed it.
2. I did not feel at all nervous about learning the ukulele.
3. I felt that it was my choice to learn the ukulele.
4. I think I am pretty good at learning the ukulele.
5. I found learning the ukulele very interesting.
6. I felt tense while learning the ukulele.
7. I think I did pretty well at learning the ukulele, compared to other students.
8. Learning the ukulele was fun.
9. I felt relaxed while learning the ukulele.
10. I enjoyed learning the ukulele very much.
11. I didn't really have a choice about learning the ukulele.
12. I am satisfied with my performance on the ukulele.
13. I was anxious while learning the ukulele.
14. I thought learning the ukulele was very boring.
15. I felt like I was doing what I wanted to do while I was learning the ukulele.
16. I felt pretty skilled at the ukulele.
17. I thought learning the ukulele was very interesting.
18. I felt pressured while learning the ukulele.
19. I felt like I had to learn the ukulele.
20. I would describe learning the ukulele as very enjoyable.

21. I learned the ukulele because I had no choice.
22. After working at learning the ukulele for a while, I felt pretty competent.

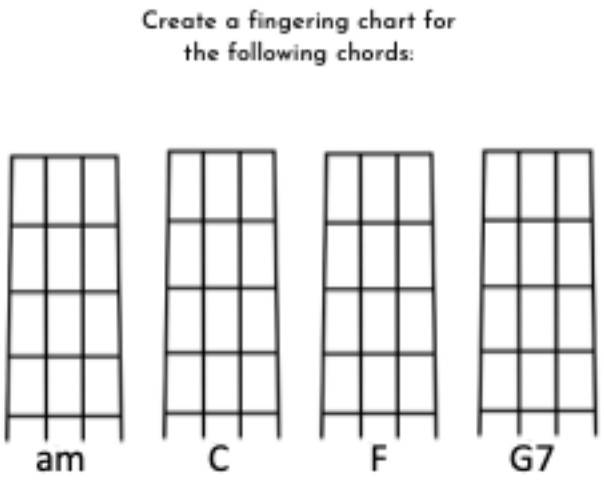
Appendix L – Google Form for Motivation Survey

This appendix is the link for the Google Form survey the participants will complete.

https://docs.google.com/forms/d/e/1FAIpQLSe4gFafTpkjhH2M---UFwdkJXyYm6oTm65XEXsNArP1GlMq3g/viewform

Appendix M – Ukulele Punch Card

1. I can translate the word "ukulele"	2. I can name the letters of the four ukulele strings.	3. I can identify the tuning pegs, neck, frets, & bridge.	4. I can play the Uptown Funk riff.	5. I can make a fingering chart for a C chord (over).
16. I can play C-F-G7-C with no rests between chords.	 PUNCH CARD Name: _____ Class: _____ 			6. I can perform a G7 chord with down strumming and good posture.
15. I can play C-G7-C with no rests between chords and strum D DU UDU.				7. I can make a fingering chart for an F chord (over).
14. I can play C-G7-C with four beats of rest between chords and strum D DU UDU.				8. I can play F-am-F with four beats of rest between chords and down/up strumming.
13. I can make a fingering chart for a G7 chord (over).	12. I can play C-F-C with no rests between chords and strum D DU UDU.	11. I can play C-F-C with four beats of rest between chords and strum D DU UDU.	10. I can make a fingering chart for an am chord (over).	9. I can play am-F-C with NO rests between chords and down/up strumming.



Appendix N – Google Form for Pilot Study

This appendix is the link for the Google Form survey the pilot study participants will complete.

https://docs.google.com/forms/d/19wS7TeTg9D4VJW_yysfE9zxb9Jcn6IKuVtCeUpm27r8/edit

Appendix O - Pilot Study Questions

1. Were you able to choose an answer that you thought best described your thoughts?
2. Were the emojis helpful to understand the answers?
3. Do you have any other suggestions?

Appendix P – Ukulele Wall of Fame Avatars