Liberty University

School of Music

Change for the Better? An Examination of How Technology-Based Instruction During COVID-19 Changed Teaching Methods in Band

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by

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Abstract

Despite having access to such technologies, most music educators were not using online worksheets, playing exercises, or video questionnaires during daily instruction prior to the COVID-19 pandemic in 2020. For example, in the band world, the only daily use of technology may have been the metronome, as most band directors focus on playing exercises and literature during class. Band classes are "hands-on" and performance-based. With the onset of the COVID-19 pandemic, band directors had to transition from traditional teaching to teaching band online quickly. To combat the rapid spread of the coronavirus, schools in all fifty states and all U.S. territories were mandated to discontinue meeting in person, forcing all educators to transition to online formats in a decidedly rapid fashion. Going from face-to-face to looking at students through a screen changed how band directors were able to teach band instantly. The issues that band directors faced during the pandemic were transitioning traditional lessons to an online format and finding solutions when faced with the limitations of technology. However, once classes returned to in-person teaching, some teaching strategies developed during the shutdown continued to be used in their face-to-face teaching. The band directors' perspectives are untold, but they do matter. Their successes can be a blueprint for new music educators or those who want to learn more about implementing technology into the classroom. This qualitative study will examine the perspectives of middle and high school band directors in Cedar Hill, Texas, who were teaching during the onset of the COVID-19 shutdown.

Keywords: COVID-19, online instruction, technology, band instruction, digital immigrants, digital natives

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List of Abbreviations

BYOD- Bring Your Own Device

COVID-19- Corona Virus Disease discovered in the year 2019

EEI- Essential Elements Interactive

ISD- Independent School District

PD- Professional Development

Chapter One: Introduction

Background

While remote or distance learning has been accessible since the nineteenth century, the reliance on technology for teaching instrumental music by educators did not exist until the year 2020. With the onset of the COVID-19 pandemic, band directors were forced to quickly transition from traditional teaching to teaching band solely online. To combat the rapid spread of COVID-19, schools in all fifty states and all U.S. territories were mandated to discontinue in-person meetings. In response, schools moved to remote learning models where students received instruction at home through online distance learning for the remainder of the academic year.[1] Long states, "To say things happened quickly is an understatement when giving a personal account. One day, you are in front of a sixty-piece wind band making music, and the next day, you find yourself behind a screen with intense eye fatigue due to the multiple hours of effort trying to keep music traditions alive."[2] One might have anticipated a seamless transition for teachers integrating technology into their traditional classroom lessons; however, this assumption proved inaccurate. Whether a teacher was a technology guru or a novice, everyone had challenges creating compelling and engaging lessons using only technology. A study by Hash found that planning instruction for remote learning was the second-highest-rated challenge cited.[3] Band directors were faced with getting the same effective results usually produced in the

[1] Phillip M. Hash, "Remote Learning in School Bands during the COVID-19 Shutdown," *Journal of Research in Music Education* 68, no. 4 (01, 2021): 383.

[2] Joshua E. Long, "The Instrument-Less Band Director," *American Educational History Journal* (2021): 141, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/instrument-less-band-director/docview/2641059473/se-2.

[3] Ibid., 393.

classroom from lessons they had to develop through an online format. Research suggests that novice teachers typically require eight weeks to appropriately adjust pacing and verbal instruction to the online medium.[4]

According to the State of Texas Music Standards for Educators, music teachers should use technology as a tool in the music class to promote students' creativity, learning, and performance.[5] However, due to the stipulation of this technology requirement in lesson plans, band directors' implementation was often confined to tasks such as using a tuner during band tuning, presenting a video to introduce a concept, or employing Finale for student composition. Rarely had technology been implemented for the entire course. Teachers predominantly used technology in classrooms, often relying on office programs, including Microsoft Office and word processing systems.[6] In a study by Gu et al., the authors state that "except for technologies of class preparation, the next most frequently used technologies outside class are those for social connection."[7]

Band directors faced other issues during the pandemic, including finding solutions when faced with the limitations of technology regarding student use and finding ways to keep students engaged in online learning. One research study found that while many districts were one-to-one with devices, only a few could provide their students with technology such as a device or

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[4] Hash, "Remote Learning," 383.

[5] Texas State Board for Educator Certification, *Music Standards, accessed 10/13/22, https://tea.texas.gov/sites/default/files/allmusic.pdf.*

[6] Gu, X., Zhu, Y., & Guo, X. (2013). Meeting The "Digital Natives": Understanding the Acceptance Of Technology in Classrooms," *Journal of Educational Technology & Society* 16, no. 1(01, 2013): 397. http://www.jstor.org/stable/jeductechsoci.16.1.392.

[7] Ibid.

Internet access.[8] Therefore, if a director encountered a student unable to fulfill the initial performance-based assignment involving technology, they would adapt the task to a written format. This adjustment was made because reproducing the learning outcome dependent on device or internet use was not feasible.

Keeping students engaged in the learning process during the shutdown posed challenges for both band directors with and without students having access to technology. One solution involved the implementation of the flipped classroom method. The flipped classroom method effectively keeps students engaged and motivated, impacting their learning achievement.[9] In the flipped classroom, learners watch content videos at home and solve problems in class.[10] Virtual learners can meet with their teachers during their regularly scheduled class time to ask questions about the assignment, participate in breakout rooms, or participate in class discussions via Google Meets. Using the flipped classroom allowed technology implementation, giving students more practice using technology in an educational setting. Notably, in the instrumental music world, the flipped classroom allowed students to practice with in-person students, observe rehearsals, and ask the director questions about the music. The flipped classroom also made it easy for teaching to continue when classes could no longer meet in person.

With the transition from in-person to online learning, many instructors had to rapidly adapt their learning goals to an online platform to meet the needs of their students.[11] Hash states,

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[8] Hash, "Remote Learning," 393.

[9] Lanqin Zheng, et al., "The Effectiveness of The Flipped Classroom on Students' Learning Achievement and Learning Motivation: A Meta-Analysis." *Journal of Educational Technology & Society* 23, no. 1 (01, 2020): 11. https://www.jstor.org/stable/26915403.

[10] Ibid., 1.

[11] Phillip M. Hash, "Remote Learning in School Bands during the COVID-19 Shutdown," *Journal of Research in Music Education* 68, no. 4 (01, 2021): 384.

"Although the situation was challenging for all teachers, music educators had to find ways of providing meaningful instruction in a subject that typically depends on students' interaction through the learning process."[12] Some of these strategies continued to be useful once students returned to face-to-face instruction. Although technology in the classroom kept students motivated and engaged, increasing learning, physical group work remained an essential component of instrumental music.[13]

Statement of the Problem

When the COVID-19 shutdown happened, many band directors were caught off guard and found themselves unprepared to teach online. The sudden shift from traditional in-person teaching to online instruction required a high level of technology usage, which was not a regular practice before the pandemic. As a result, band directors had to adapt quickly and develop effective strategies through their own research efforts. The core concepts of this research study focus on exploring the technology-based instruction used for band classes and the readiness of band directors to teach band online. The main goal of this study is to identify the different strategies that the band directors developed during the shutdown and to discover which ones they continued to use even after the schools resumed face-to-face instruction.

Statement of the Purpose

Although the COVID-19 shutdown resulted in an unprecedented disruption in education that affected all disciplines, including instrumental music, this period created opportunities for

[12] Hash, "Remote Learning," 384.

[13] Charmaine Bissessar, *Emergency Remote Learning, Teaching and Leading: Global Perspectives* (Springer: Cham, 2021): 89. https://doi.org/10.1007/978-3-030-76591-0

band directors to incorporate a broader range of technology, music theory, history, and culture lessons and more focus on individual musicianship.[14] This study aimed to discover practical strategies developed by band directors in the Cedar Hill Independent School District due to the shutdown. The qualitative research method was the most suitable for this study as data were collected from interviews and a literature review. Creswell and Creswell list "natural setting" and "researcher as key instrument" as characteristics of qualitative research.[15] Therefore, an open-ended survey was used to collect qualitative data from middle and high school band directors. In addition, the researcher interviewed band directors of Cedar Hill ISD to collect additional data concerning the directors' perspectives on teaching before, during, and after the shutdown caused by the COVID-19 pandemic.

Existing literature on COVID-19 teaching experiences, the use of technology, and teacher preparedness in teaching with technology was reviewed to find existing trends. The literature research influenced the formulation of the interview questions. The researcher interviewed middle and high school band directors in Cedar Hill ISD who taught band before, during, and after the shutdown. The purpose of the interviews was to gather the perspectives of the band directors regarding their experiences. The study's results are based on data collected from these interviews and a comparison to the trends found in the existing literature. In addition to issues related to teaching during the pandemic, directors were asked about their preparedness to teach online and whether they were taught these strategies in college or learned them on their own.

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[14] Hash, "Remote Learning," 394.

[15] John Creswell and J. David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (London: SAGE, 2018), 181.

Significance of the Study

According to Prensky, digital immigrant teachers "assume that learners are the same as they have always been and that the same methods that worked for the teachers when they were students will work for their students now."[16] Most band directors in Cedar Hill ISD started teaching band in the 1990s and are considered digital immigrants. During the shutdown, these band directors were faced with trying to teach band in a non-traditional manner, and teaching band online remotely, close to how they taught band for years, proved challenging. However, strategies were developed and incorporated into the classroom once students returned to in-person learning.

This study provides other music educators with successful tools to use in the band room when attempting to utilize technology in their band curriculum. Often, educators are aware of instructional technologies available but have not yet grasped their practical applications. Research shows that despite teachers recognizing the utility of technology, they are less inclined to incorporate it into their lessons if they feel uncomfortable using it.[17] The directors' statements from this study provided several successful instructional technologies in the band classroom. In addition to providing ideas on how to implement instructional technology, this study will offer college instructors of music teachers information that can be included in their college curriculum to prepare their students better to teach with technology effectively.

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[16] Mark Prensky, "Digital Natives, Digital Immigrants," *On the Horizon* 9, no. 5 (10, 2001): 3, https://www.marcprensky.com/writing/Prensky%20%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf.

[17] Xiaoqing Gu et al., "Meeting The "Digital Natives": Understanding the Acceptance Of Technology in Classrooms," *Journal of Educational Technology & Society* 16, no. 1(2013): 398-399. http://www.jstor.org/stable/jeductechsoci.16.1.392.

Research Question and Sub Questions

This study explored the technology-based instructional strategies used to teach middle and high school band before the COVID-19 pandemic and how the middle and high school band directors adapted their instruction to an online format. In addition, the study discovered new technology-based instructional strategies that band directors currently use. The research aimed to answer the following questions:

Research Question 1: What types of technology were used by middle and high school band directors in the residential classroom before the COVID-19 pandemic in Cedar Hill, Texas?

Research Question 2: What technological challenges were faced by middle and high school band educators during the COVID-19 pandemic in Cedar Hill Independent School District?

Research Question 3: What new technologies were used during the COVID-19 pandemic and continued to be used in the classroom post-pandemic in Cedar Hill Independent School District?

RQ1 identifies the most commonly used technologies utilized in the classroom. RQ2 will provides insight into the challenges experienced by band directors adapting to online teaching, and RQ3 identifies the most successful and innovative technologies implemented by band directors in the post-pandemic classroom setting. This research provides a more comprehensive understanding of the technology-based instructional strategies used by middle and high school band directors in Cedar Hill, Texas, and how these strategies have evolved during and after the COVID-19 pandemic.

Definition of Terms

COVID-19 – Coronavirus disease 2019 (COVID-19) is a highly contagious viral illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[18]

COVID-19 Pandemic – The COVID-19 pandemic, known as the coronavirus pandemic, is an ongoing global pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The World Health Organization (WHO) declared the outbreak a public health emergency of international concern on January 30, 2020, and a pandemic on March 11, 2020. As of October 14, 2022, the pandemic had caused more than 624 million cases and 6.56 million confirmed deaths, making it one of the deadliest in history.[19]

Digital Immigrants – a term coined by Marc Prensky to identify learners who were introduced to technology late in their learning.[20]

Digital Natives – a term coined by Marc Prensky to identify learners who grew up with technology from birth.[21]

Digital Fluency - Digital literacy was commonly used decades ago and alluded to for the first time in 1997 by Paul Gilster in his book "Digital Literacy." According to the definition, digital literacy is the ability to employ and consider digital tools, resources, or services in daily activities as one of the life skills.[22]

Flipped Classroom – considered an "inverted classroom" or "reversed instruction." In the flipped classroom, learners watch the content videos at home and solve problems in the class. The flipped classroom switches the in-class and out-of-class time to enable more interactions between teachers and students.[23]

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[18] Marco Cascella et al., "Features, Evaluation, and Treatment of Coronavirus (COVID-19)," *StatPearls* (2023): https://www.ncbi.nlm.nih.gov/books/NBK554776/

[19] Wikipedia contributors, "COVID-19 pandemic," *Wikipedia, The Free Encyclopedia*, https://en.wikipedia.org/w/index.php?title=COVID-19_pandemic&oldid=1214703055 (accessed March 21, 2024).

[20] Qian Wang, Michael D. Myers, and David Sundaram, "Digital Natives and Digital Immigrants: Towards a Model of Digital Fluency," *Business &Amp; Information Systems Engineering* 5, no. 6 (August 2013): 409, https://doi.org/10.1007/s12599-013-0296-y.

[21] Ibid.

[22] Sherly Rahmawati, Ade Gafar Abdullah, and Isma Widiaty, "Teachers' Digital Literacy Overview in Secondary School," *International Journal of Evaluation and Research in Education* 13, (2024): 597,10.11591/ijere.v13i1.25747.

[23] Lanqin Zheng, et al., "The Effectiveness of The Flipped Classroom on Students' Learning Achievement and Learning Motivation: A Meta-Analysis." *Journal of Educational Technology & Society* 23, no. 1 (01, 2020): 1. https://www.jstor.org/stable/26915403.

Remote Learning – occurs when the student and the educator are not physically present in a traditional classroom environment. Remote learning also refers to educational activities with various formats and methods, most of which take place online.[24]

Summary

The onset of the COVID-19 pandemic revealed the underutilization of technology in education. Teachers had to transition instruction from traditional classrooms to remote online with little or no preparation, adjusting goals and activities to fit remote learning while meeting students' needs.[25] Band directors incorporated video conferencing, learning management systems, and noninteractive websites into their lessons, providing various opportunities for students to stay motivated and engaged in learning. Although teachers and students have returned to the classroom, teachers can still utilize the discussed opportunities. Research suggests that the success of remote learning in the future will depend on music educators developing plans, creating materials, building infrastructure, and preparing students for online and offline instruction.[26]

[24] Hash, "Remote Learning," 381.

[25] Ibid., 384.

[26] Ibid., 393.

Chapter Two: Literature Review

Introduction

This study surveyed middle and high school band directors teaching in Cedar Hill, Texas, during the onset of the COVID-19 shutdown. It uncovered the types of technology and resources they used to continue teaching band online. In addition to revealing technology-based strategies implemented to continue teaching instrumental music online during the COVID-19 pandemic, the researcher hoped to discover successful ways music educators use technology in the instrumental music classroom post-pandemic. This chapter highlights and expounds on the idea of the digital native and digital immigrant, the types of technology music educators were using in the classroom before the COVID-19 pandemic, the Housewright Declaration and Vision 2020 as it relates to technology in music education, COVID-19 shutdown experiences from music teachers during and after the shutdown, and how technology was used to continue to provide quality music instruction.

Digital Natives and Digital Immigrants

Band directors with over fifteen years of teaching experience are categorized as digital immigrants, while their students are regarded as digital natives. Digital immigrants and digital natives are explained in Mark Prensky's article "Digital Natives, Digital Immigrants." According to Prensky, digital natives are the first generations to grow up with technology, spending their entire lives surrounded by and using computers, video games, digital music players, video cams,

cell phones, and all the other toys and tools of the digital age, making computer games, email, the Internet, cell phones and instant messaging integral parts of their lives.[27]

Because of their exposure to technology from birth, digital natives "think and process information fundamentally differently from their predecessors," the digital immigrants.[28] Prensky states that digital immigrants are "those of us who were not born into the digital world but had, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology."[29]

Prensky further explains that to teach in the manner that digital natives learn best. Digital immigrants must "reconsider both our methodology and our content" by learning to "communicate in the language and style of their students."[30] In other words, digital immigrants must learn how to teach the same "old" thing but in a "new" way, just as band directors had to do during the shutdown caused by the COVID-19 pandemic. Moreover, Prensky underscores the necessity for today's band directors to develop "digital native methodologies" tailored explicitly for instrumental band methods.[31]

Prensky's first article posits that "digital natives' brains are likely to be physically different due to the digital input they received when growing up."[32] In his second article, "Digital

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[27] Marc Prensky, "Digital Natives, Digital Immigrants Part 1," *On the Horizon* 9, no. 5 (October 2001): 1, https://doi.org/10.1108/10748120110424816.

[28] Ibid.

[29] Ibid.,1-2.

[30] Ibid., 3-4.

[31] Ibid., 6.

[32] Marc Prensky, "Digital Natives, Digital Immigrants Part 2: Do They Really Think Differently?" *On the Horizon* 9, no. 6 (2001): 1, https://doi.org/10.1108/10748120110424843.

Natives, Digital Immigrants Part 2: Do They Really Think Differently?" he presents evidence from neurobiology and social psychology studies to support his conclusion. Prensky notes that research in neurobiology discovered that "stimulation of various kinds actually changes brain structures and affects the way people think and that these transformations go on throughout life."[33]

Today's educators need to understand that their students' brains are "wired" differently than theirs, which requires them to present information in a way that their students will receive and understand. Prensky also discovered that the brain could be molded by the environment to which one may be exposed. According to Prensky, "Social psychology also provides strong evidence that one's thinking patterns change depending on one's experiences."[34] Because of their "twitch-speed world," today's students are "bored by most of today's education."[35] The solution for educators would be to create new approaches to education to address the cognitive differences of digital natives better.[36]

In Autry and Berge's article, "Digital Natives and Digital Immigrants: Getting to Know Each Other," the authors explore the characteristics of the digital native and the digital immigrant. In addition, Autry and Berge address challenges in training and developing the future workforce in the twenty-first century. Although this study was not based on music education, the techniques discussed can be applied when teaching music. According to Autry and Berge, there should be no surprise that "technology might be wiring (digital natives) or rewiring (digital

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[33] Prensky, "Digital Natives, Digital Immigrants Part 2," 1.

[34] Ibid., 4.

[35] Ibid., 5.

[36] Ibid.

immigrants) as we continue to use technology in our daily routines."[37] The authors reference Prensky's stance on the effect of technology on the brain and how the brain processes information, stating, "The brain has the capability to reorganize and cognitively process information based on the data it has processed throughout our lifetime.[38] Autry and Berge summarize this process:

> The generational gap between Baby Boomers and Gen Yers has resulted in the brain inputs from a linear systematic approach to a rapid bombardment of information from a digital multimedia/tasking world. The reinforcement of stimuli on the brain can affect the brain's internal ability to sort, connect, and store bits of data for future use. The reinforcement of these inputs "wires" our brain to process its outputs. If our brains are accustomed to receiving digital data then it becomes "hardwired" to easily process similar information.[39]

Knowing the best ways to communicate with the digital native can help teachers enhance the effectiveness of instruction.

In addition to recognizing how to communicate with digital natives, digital immigrants can also increase their digital fluency to develop effectiveness in their instruction. Digital fluency, as defined by Wang, is "the ability to reformulate knowledge and produce information to express oneself creatively and appropriately in a digital environment."[40] In the article "Digital Natives and Digital Immigrants: Towards a Model of Digital Fluency," Wang states, "there are two characteristics commonly used to define the difference between the two: age and accessibility," and identify the level of digital fluency to be the real separating factor between

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[37] Alex J. Autry and Zane Berge, "Digital Natives and Digital Immigrants: Getting to Know Each Other," *Industrial and Commercial Training* 43, no. 7 (April 2011): 462, https://doi.org/10.1108/00197851111171890.

[38] Ibid., 465.

[39] Ibid.

[40] Qian Wang, Michael D. Myers, and David Sundaram, "Digital Natives and Digital Immigrants: Towards a Model of Digital Fluency," *Business &Amp; Information Systems Engineering* 5, no. 6 (August 2013): 409, https://doi.org/10.1007/s12599-013-0296-y.

digital immigrants and digital natives.[41] This means that the digital immigrant teacher can become just as tech-savvy as the digital native by increasing their knowledge of using technology. In other words, this involves achieving high proficiency and comfort with various technological devices and applications. The authors encapsulate this concept by stating, "Being digitally fluent not only involves knowing how to engage with technology but also being able to produce things of significance with technology."[42] After a systematic review of literature from multiple disciplines, Wang concluded that many factors could directly or indirectly impact one's digital fluency.[43] These factors include demographic characteristics, organizational factors, psychological factors, social influence, opportunity, behavioral intention, and actual use of digital technologies.[44]

Furthermore, Gu states, "The success of technology integration into classrooms depends on how end users, including teachers and students, accept and use technology."[45] Therefore, for teachers to successfully incorporate technology into their lessons, they must be open to embracing new teaching methods using technology. However, this principle applies reciprocally. Although considered more tech-savvy than the teacher, the student must be able to utilize technology proficiently in an educational setting. In Gu's study, the authors found that students' use of technology was greater outside the classroom than in educational settings.[46] One common

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[41] Wang, Myers, and Sundaram, "Towards a Model of Digital Fluency," 410.

[42] Ibid.

[43] Ibid., 417.

[44] Ibid.

[45] Xiaoqing Gu, Yuankun Zhu, and Xiaofeng Guo, "Meeting the 'Digital Natives': Understanding the Acceptance of Technology in Classrooms," *Journal of Educational Technology & Society* 16, no. 1 (January 2013): 392.

[46] Ibid., 398.

challenge faced by teachers during the shutdown while teaching online was students expressing difficulty in completing online assignments. Gu's findings indicate that students were not using as much information and communication technology as their "immigrant" teachers and that "they are not using as much ICT (Information and communication technology) at home as in class."[47] They suggest that to combat this trend, teachers need to utilize technology more in class so that students can become more familiar with how to use technology in an educational setting.

Bannerman and O'Leary conducted a study on digital natives currently studying to become future music teachers and their "personal use of technology, views toward technology in music teaching and learning, and experience with music technology."[48] Similar to Wang, the authors emphasize that "researchers have warned against assuming technological competencies based solely on a person's age" and feel that "technology use occurs in different educational contexts."[49] Bannerman and O'Leary highlight that digital native pre-service music teachers feel at ease using technology for administrative tasks, including communicating with parents or managing a grade book. However, integrating technology into teaching scenarios may not come as naturally to them.[50] As a result, their technology use has been more teacher-centered than student-centered. Although technology is used primarily for administrative tasks and less

[47] Gu et al., "Meeting the 'Digital Natives," 399.

[48] Julie K. Bannerman and Emmett J. O'Leary, "Digital Natives Unplugged: Challenging Assumptions of Preservice Music Educators' Technological Skills," *Journal of Music Teacher Education* 30, no. 2 (2020): 10, https://doi.org/10.1177/1057083720951462.

[49] Ibid., 11.

[50] Ibid.

commonly in instructional scenarios, the authors found that "technology integration has been a desired area of professional development."[51]

Furthermore, Bannerman and O'Leary state that the participants in their study were "interested in learning technologies to help them teach in the future (85%) and believed that technology could both help them teach better (81%) and help students learn better (80%)."[52] They concluded that the challenge is up to music teacher educators "to help pre-service music teachers (a) recognize professional uses of technology and build skills that transcend passive consumption to include creative applications of music technology and (b) view technology as an essential component of effective music learning experiences in K–12 schools."[53]

In their article, "Educational Technologies For K-12 Learners: What Digital Natives and Digital Immigrants Can Teach One Another," Riegel and Mete explored the relationship between the digital native and digital immigrant in a K-12 classroom environment, asking what digital immigrants and digital natives can learn from each other. They assert, "Since both digital natives (students) and digital immigrants (teachers) work together in the K-12 classroom, it is vital that both groups use their strengths to enhance each other's knowledge pertaining to technology."[54] They further list the characteristics of both digital immigrants and natives, emphasizing their strengths and illustrating how they can mutually benefit. Specifically, the authors point out that digital immigrants "prefer to speak face-to-face as opposed to texting" or "rather interact with

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[51] Bannerman and O'Leary, "Digital Natives Unplugged," 12.

[52] Ibid., 15.

[53] Ibid., 20.

[54] Caitlin Riegel and Rosina Mete, "Educational Technologies For K-12 Learners: What Digital Natives and Digital Immigrants Can Teach One Another," *Educational Planning* 24, no. 4 (2018): 49.

one individual or a few people rather than a large group." They attribute these preferences to the "importance of human connection in person as opposed to connecting to an individual electronically."[55]

Within the K-12 classroom, the digital immigrant prioritizes face-to-face interactions among students over implementing technological educational aids and possesses a learning pattern focusing on logical rationale.[56] Conversely, digital natives are "fluent in acquiring and learning all sorts of new technology," considered "intuitive learners," and "can quickly adapt to technological advances" due to their consistent use of electronic devices.[57] According to Riegel and Mete, "digital natives are comfortable with the quick transfer of information and multitask with ease, compared to their digital immigrant counterparts."[58]

Regarding the K-12 classroom, digital natives "are more comfortable with the integration of multimedia such as audio, video, and images to promote learning."[59] The authors conclude with suggestions on how digital natives and digital immigrants can work with and learn from each other in an educational setting. They recommend choosing words carefully when interacting with either group, avoiding blatant assumptions, encouraging individuals to use a strengths-based lens, and focusing on the positive characteristics and abilities of both digital immigrants and natives. Additionally, they propose supporting one another, whether one is a digital immigrant or

[55] Riegel and Mete, "Educational Technologies," 50.

[56] Ibid.

[57] Ibid., 51.

[58] Ibid.

[59] Ibid.

digital native, providing assistance, answering questions, and listening to each other.[60] The authors believe that adopting these practices will "help reduce barriers to communication and also foster collaboration and goodwill amongst staff and students."[61]

Technology in the Classroom

Whether teachers are professionals or novices at integrating technology into their lessons, research shows there are benefits in designing lessons with technological counterparts. According to Canough, "Technology in the classroom is an invaluable tool with which teachers can better transmit information to students."[62] Moreover, due to society's need for instant informational gratification, "people have begun to gain knowledge through the Internet, television and other types of media. It has become apparent that society is changing how it gathers and stores information."[63] Technology has created a significant shift in education. As a result, educators are challenged to keep up with various media that are interesting to students while still being able to create rigorous content.[64] However, although educators understand the importance of integrating technology, a few obstacles may hinder its successful integration. These barriers include the educator's ability to "gain access to the types of resources needed to effectively implement these technologies," having enough technology-related professional

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[60] Riegel and Mete, "Educational Technologies," 56-57.

[61] Ibid., 57.

[62] Jeanne Canough, "Effective Implementation of Technology in the Classroom," *Education Masters* (Fisher Digital Publications, August 2013), 20, https://fisherpub.sjf.edu/.

[63] Ibid., 2.

[64] Ibid.

development, and the educator's lack of learning-based programs that educators can use to "create and convey data in a manner where learning can be student-based."[65]

Although every educator may not have had an overabundance of technology-based lesson use, some educators implemented technology into their lessons before the COVID-19 shutdown through YouTube, *Bring Your Own Devices* (BYOD) guidelines and digital curriculums. YouTube was a valuable source that some music educators used to implement technology in the classroom before the COVID-19 shutdown. Since its introduction to the World Wide Web in 2005, YouTube has become increasingly popular.[66] With over 2.68 billion active users, YouTube is the second most visited site worldwide, followed by Facebook.[67] Josef Hanson's "Assessing the Educational Value of YouTube Videos for Beginning Instrumental Music" discusses the numerous benefits of using YouTube videos in an instrumental music class. Hanson states that the "use of this technology requires the same level of integrity and adherence to professional standards expected in the classroom or rehearsal hall—a challenge to be sure. However, the benefits are numerous: portability of instruction, the immediacy of guidance, and the possibility of attracting more students and enhancing the public image of the profession."[68] Hanson's study assessed instrumental music tutorials on YouTube and the educational value these videos could provide to beginning instrumental music students.

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[65] Canough, "Effective Implementation," 5-8.

[66] Jennifer Whitaker, "Concert Band Literature on YouTube," *Journal of Band Research* 53, no. 2 (Spring, 2018): 16, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/concert-band-literature-on-youtube/docview/2082514220/se-2.

[67] Daniel Ruby, "YouTube Statistics: Insights and Infographics," Demand Sage Website, June 6, 2023, https://www.demandsage.com/youtube-stats/

[68] Josef Hanson, "Assessing the Educational Value of YouTube Videos for Beginning Instrumental Music," *Contributions to Music Education* 43 (2018): 152.

In "Concert Band Literature on YouTube," Whitaker discovered that previous examinations of band literature found many compositions on YouTube to be of "serious artistic merit."[69] The author explored the "musical selection behaviors" of those who upload and view concert band literature posted on YouTube.[70] Whitaker states, "YouTube users are seeking out and spending time listening to concert band compositions as evidenced by over 28 million total views of concert band literature postings."[71] As a part of music study, directors often present a video of the piece, providing students with a visual of the sheet music while they listen to the music or as a listening guide while following along with their sheet music. The availability of YouTube allows directors to integrate material from the platform into rehearsals and lessons, making YouTube a valuable teaching tool.[72]

In addition to offering examples of concert band literature performances, YouTube videos encompass content generated by other music teachers. These videos can assist in reinforcing musical concepts or instructing music theory. Despite the numerous valuable resources on YouTube, it is essential to research and review each video before incorporating it to confirm its relevance to the lesson, given that YouTube videos can serve as a "beneficial and relevant" supplement to an educator's existing pedagogy.[73]

Another way educators used technology in the classroom before the shutdown was through mobile devices. With the introduction of BYOD, students could bring their laptops,

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[69] Whitaker, "Concert Band Literature,"17.

[70] Ibid., 16.

[71] Ibid., 27.

[72] Ibid.

[73] Hanson, "Assessing the Educational Value," 152.

tablets, and mobile devices into the classroom to assist with learning. Although students' devices were a significant distraction initially, schools and teachers began to accept the BYOD model over time. Kibar found the following as valid reasons for the acceptance of BYOD:

1. Educational practices must adapt to technological changes as technology plays an essential role in students' daily lives, increasing their use of mobile technologies. For this reason, mobile devices can play a supportive role in learning activities.[74]

2. Mobile devices provide educators flexibility when redesigning tasks, expanding and enhancing interaction within classrooms or online environments, and allowing students to learn, create, share, and collaborate anytime and anywhere while supporting greater flexibility for learning pathways.[75]

3. BYOD supports the development of digital literacy skills such as creativity and innovation skills and improved communication and collaboration among peers, all skills needed in the 21st century.[76]

Lehman conducted a research study investigating mobile technology and its perception as a positive or negative tool in the classroom and found that it could benefit student learning.[77] According to Lehman, because children of all ages are attracted to new technologies, using technology in the classroom can help keep students engaged and promote participation, making them feel like they are an active part of the lesson.[78] Although student devices can be a

[74] Pınar Nuhoğlu Kibar, Abdullah Yasin Gündüz, and Buket Akkoyunlu, "Implementing Bring Your Own Device (BYOD) Model in Flipped Learning: Advantages and Challenges," Technology, Knowledge and Learning 25, no. 3 (2019): 467, https://doi.org/10.1007/s10758-019-09427-4.

[75] Ibid.

[76] Ibid.

[77] Alexander Lehman, "Student and Teacher Perceptions of Mobile Technology in the Middle School Technology and Engineering Education Classroom," (Thesis, Millersville University of Pennsylvania, 2019), iv, https://www.jstor.org/stable/community.31982645.

[78] Ibid., 9.

distraction, when incorporated into the lesson, they can serve as a "hook."[79] However, teachers and students alike admitted to using their mobile devices for personal use during class.[80]

When investigating the technology utilized by high school music students to enhance their musicianship, Hsu identified the most prevalent uses for students' devices and the most used applications. Of the 109 participants, 107 owned a smart device.[81] Most of these smart devices included smartphones or iPads. Most students (94.45%) used technology for learning.[82] Of that 94.45%, more than half stated they use their devices for music learning.[83] The most common use in music learning was using their smart device as a metronome or tuner.[84] Other uses for the students' smart devices were for listening to music, using sheet music, and looking up fingering charts.[85] When asked, "What technological devices and/or programs do you use/prefer most in your musical practice?" participants expressed that YouTube was the most popular application.[86] Hsu suggests that understanding how students employ their devices for music learning and identifying their preferred practice applications is an initial step in attempting to integrate technology into the classroom.[87]

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[79] Lehman, "Student and Teacher Perceptions," iv.

[80] Ibid., 58.

[81] Emile Hsu, "In their Hands: Extra-Curricular use of Technology by High School Music Students," (master's thesis, William Paterson University, 2018), 26, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/their-hands-extra-curricular-use-technology-high/docview/2087758224/se-2.

[82] Ibid., 27.

[83] Ibid., 29.

[84] Ibid., 31.

[85] Ibid., 31.

[86] Ibid., 32.

[87] Ibid., 47.

One of the simplest ways to integrate technology in the music classroom is using a smartphone as a tuner. Davis expresses the following regarding technology and its use in tuning: "As technology becomes more of a central component of educational life, it is important to study its effectiveness as well as how to effectively use it. Technology has been developed to replace aural stimuli like the tuning fork or to provide a visual response to a musician's pitch. Other advancements include computer-based training programs."[88]

Davis surveyed three middle school band directors, examining their "pedagogical approaches" to teaching intonation.[89] Of the many software programs the directors used, SmartMusic was used because of the variety of tools and exercises it provides for individual practice, such as a metronome and tuner.[90] One of the participants discussed using technology as part of the warm-up session in class, stating:

> The introduction of technology has been a tremendous help. But having not grown up with the technology, it is a challenge for me to utilize and know what's out there to be aware of things. So, when I became aware of the APS tuning trainer, "Hey, let's start using that." That sounds good. Tonal Energy tuner, "Yep! Like that! Let's get that. Like that a whole lot."[91]

The Tonal Energy app, available for download on students' smart devices, enhances accessibility to tuning compared to sharing a single large tuner. With this app on their devices, students can tune in their seats both before and during class. Despite utilizing technology for tuning assistance, the author emphasizes that other elements, such as teaching students pitch tendencies

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[88] Joshua Matthew Davis, "Expert Middle School Band Directors' Pedagogical Approaches to Intonation Instruction," (PhD diss., University of Florida, 2019), 40, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/expert-middle-school-band-directors-pedagogical/docview/2469533001/se-2.

[89] Ibid., 65.

[90] Ibid., 43.

[91] Ibid., 98.

for their instruments and engaging in activities to enhance aural skills, were integrated when instructing students in tuning.[92]

In an article discussing digital curricula in 21st-century elementary music classrooms, Murillo states, "The use of technology in music education has long been considered a tool for measuring music competency, assisting instruction and methods, and supplementing the classroom with multimedia resources." Before COVID-19, middle school band directors used a digital music curriculum associated with the band method book. A digital music curriculum is an electronic resource that provides supplemental lesson content and instruction.[93] Most resources provided were files that could be read with SmartMusic. These files allowed students to play assigned exercises from the method book along with an accompaniment. The SmartMusic software could also evaluate students' performance in the exercise, presenting a visual representation of both correct and incorrect pitches played. Subsequently, these assessments could be forwarded to the directors as audio files. In addition to online supplements to the method book, Murillo notes that other tools included in digital music curriculums are "music and video streaming sites, music theory applications, lesson plan resources, digital instrument players, accompaniment and notation software, and music games."[94]

In a case study on integrating SmartMusic into middle school band classrooms, Tucker discovered that despite being a program for individual practice, teachers successfully used

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[92] Davis, "Expert Middle School Band Directors", 131-132.

[93] Robert E. Murillo, "The 21st Century Elementary Music Classroom and the Digital Music Curriculum: A Synergism of Technology and Traditional Pedagogy," *Texas Music Education Research* (2017): 18, https://doi.org/http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2F21st-century-elementary-music-classroom-digital%2Fdocview%2F2101884741%2Fse-2%3Faccountid%3D12085.

[94] Ibid.

SmartMusic in whole group settings more often than individually.[95] Tucker observed that utilization of SmartMusic varied from teacher to teacher. According to Tucker, the ways that teachers use SmartMusic include "assessment, whole-group, and individual settings, method book and concert literature rehearsal, and ear training."[96] The author notes that student engagement was increased due to their enjoyment of interacting with SmartMusic, prompting teachers to use the program more often.[97]

Housewright Declaration and Vision 2020

The Housewright Symposium was held on the Florida State University campus from September 23–26, 1999, in Tallahassee, Florida. The event was led by June Hinckley, who served as the Music Educators National Conference (MENC) president then. Hinckley decided it was time to revisit the goals and visions for music education by the Tanglewood Symposium of 1967 and set new goals and ideas for the first twenty years of the new millennium, hence the name Vision 2020.[98] Hinckley's vision was to provide music educators with a plan to follow for the next twenty years and consider all known changes that could be imagined.[99]

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[95] Carla Fowler Tucker, "A Case Study of the Integration of SmartMusic into Three Middle School Band Classrooms Found in Upstate South Carolina," (D.E. diss., Education Dissertations and Projects, 2016), 94, https://digitalcommons.gardner-webb.edu/education_etd/170.

[96] Ibid., 95.

[97] Ibid., 94-95.

[98] Eric Branscome, "Vision 2020 and Beyond: Imminent Deadlines of the Housewright Declaration," Contributions to Music Education 41 (2016): 71, http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Fvision-2020-beyond-imminent-deadlines-housewright%2Fdocview%2F1790516783%2Fse-2%3Faccountid%3D12085.

[99] Clifford Madsen, "Reflecting on Past, Present, Future: The Vision 2020 Report for Music Education," Contributions to Music Education 45 (2020): 21-22, http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Freflecting-on-past-present-future-vision-2020%2Fdocview%2F2404068114%2Fse-2%3Faccountid%3D12085.

The symposium concluded with the Housewright Declaration, which listed twelve points (Appendix E) that the current music educators thought should be evident in music education by 2020. Among these points, the fifth addresses technology. Point 5 of the Housewright Declaration emphasizes that music educators must be proficient and knowledgeable about technological changes and advancements. They should be ready to employ all relevant tools to advance music study while acknowledging the importance of people congregating to create and share music.[100]

Because the Housewright symposium coincided with the start of a new millennium, the event occurred during a time filled with "hope, noble ideals, innovative thinking, and such qualities that tend to characterize new beginnings."[101] McCarthy's article aimed to examine the Housewright Declaration and offer an interpretation of "the extent to which developments since 2000 advanced the twelve statements set forth therein."[102] The author points out that new forms of communication enabled by technological advancements were one of three trends that impacted music education.[103] Educators could see that technology would change music education, but not to the extent it is seen today. McCarthy related the following regarding the impact of technology on music education and music educators' responsibility to adapt to it:

> Along with a broadening of the music curriculum was the unprecedented expansion of technological tools to facilitate music teaching and learning. The Declaration writers were clear that music educators need to be informed and proficient concerning

[100] "The Housewright Declaration - NAfME," National Association for Music Education, accessed April 19, 2023, https://nafme.org/wp-content/uploads/2015/12/18-HousewrightDeclaration.pdf.

[101] Marie McCarthy, "The Housewright Declaration: A Lens for Viewing Music Education in the Early Twenty-First Century," *Contributions to Music Education* 45 (2020): 48, https://www.jstor.org/stable/26974516.

[102] Ibid., 48-49.

[103] Ibid., 49.

> "technological changes and advancements and be prepared to use all appropriate tools in advancing music study" (statement 5). Advancements in technology have transformed the spaces of music, learning and communication. Uses of technology have been applied across a range of learning contexts, from performance to composition, special needs learners to self-evaluation, practicing to music reading, access to unfamiliar music cultures to cross-cultural communication, recording to multimedia productions, and the list goes on.[104]

In the article "A Look Ahead: Music Education from 2020 to 2050," Lehman takes a different approach by discussing what music may look like in the year 2050. The author observes that, upon reviewing Vision 2020 and its goals for music education, there seems to be minimal evolution since the Housewright Declaration.[105] Therefore, in addition to funding and professional development, technology is an issue that music educators need to consider in their outlook for education between 2020 and 2050.[106] The following explains Lehman's thoughts on the impact and importance of technology in music education:

> There is probably no force with more significant potential to transform education than technology. New electronic devices that make it easier for students to create, perform, and listen to music are appearing constantly. Technology can alter in profound and irreversible ways the means by which music is taught and learned in school, just as it is altering in profound and irreversible ways the roles that music plays in peoples' lives outside the school. We should embrace those uses of technology that are helpful and minimize the impact of those that are not.[107]

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[104] McCarthy, "The Housewright Declaration," 57.

[105] Paul R. Lehman, "A Look Ahead: Music Education from 2020 to 2050," *Contributions to Music Education* 45 (2020): 67, http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Flook-ahead-music-education-2020-2050%2Fdocview%2F2404068044%2Fse-2%3Faccountid%3D12085.

[106] Ibid., 69.

[107] Ibid., 70.

However, despite the independence that technology may create in students and the "enormous potential of technology to reshape education," teachers will continue to be "indispensable" as the "single most essential element in education."[108]

COVID-19 Shutdown Experiences

Experiences During the Shutdown

In March 2020, the world came to a standstill. In response to COVID-19, a worldwide pandemic, businesses and schools shut down immediately, causing everyone except essential workers, such as hospital staff and emergency responders, to remain inside their homes. Eventually, government officials determined that those in education would need to finish the year remotely. As a result, learning how to teach remotely with the technology available became necessary, irrespective of the teachers' preparedness. The shutdown coincided with the concert festival season for band, chorus, and orchestra directors. Despite most directors acknowledging that the festival would not take place in the spring of 2020, they were still confronted with the challenge of instructing a performing arts class in a non-traditional way through remote learning.

In a study by Hash, the experiences and perspectives of elementary and secondary school band directors about teaching remotely during the COVID-19 shutdown were examined. The author found that during remote instruction, instead of meeting daily or every other day for class, most directors met with students through video conferencing once a week or less.[109] As a result, participation from students was directly impacted by remote learning. In addition to student interest in the online activities provided by the director, other factors that may have hindered

[108] Lehman, "A Look Ahead," 70.

[109] Phillip M. Hash, "Remote Learning in School Bands during the COVID-19 Shutdown," *Journal of Research in Music Education* 68, no. 4 (01, 2021): 391.

participation included "students' access to the Internet due to multiple people needing to use a single computer, student obligations in caring for younger siblings, and parents not allowing their child to play an instrument while other family members were working or schooling from home."[110] The greatest challenge for most directors involved in the survey was sustaining remote learning to the end of the year, which the lack of parental support may have intensified.[111]

In an article discussing a personal experience of the COVID-19 pandemic, Long describes how the quick change from teaching in-person to online created intense eye fatique in an attempt to "keep music traditions alive."[112] At the time of the shutdown, Long, a college band director, was unaware that the pandemic would significantly impede his ensembles' capacity to create music collectively for an extended duration. The driving force behind most ensembles is the ability to make music together while performing. Due to the extensive precautions put into place to prevent the spread of COVID-19, performing groups were not allowed to play together in person. The void created was a loss of the "interaction experience."[113]

Because of the university mandates regarding the playing of instruments, Long's groups were allowed to gather in socially-distanced sanctioned rooms but not allowed to play their instruments. Due to the students' inability to play instruments, band rehearsals in the fall of 2020 were "anything but normal."[114] Long states, "It is the connection to others that not making music

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[110] Hash, "Remote Learning," 392.

[111] Ibid.

[112] Joshua E. Long, "The Instrument-Less Band Director," *American Educational History Journal* (2021): 141, http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarlyjournals%2Finstrument-less-band-director%2Fdocview%2F2641059473%2Fse-2%3Faccountid%3D12085.

[113] Ibid., 142.

[114] Ibid., 144.

together lacks. Thus, I watched many fellow musicians lose interest even though they were active with our activities."[115] Although Long believed there would be a gap in music education due to the inability to function with "normal" practices, satisfaction was found in seeing other music directors not give up the fight and continue to teach students as best as possible.[116]

In "Waiting for the Laughter," MacLaine discusses how excitement turned into sobering thoughts following the closing of schools due to the COVID-19 pandemic. MacLaine states, "When the announcement was made that the COVID-19 pandemic would mean an extension of our March break, I was, at first, thankful."[117] However, MacLaine began to lose the initial excitement after realizing that the break was being extended for the remainder of the year. The author recalls:

> As the virus spread, it soon became evident that the impact of this pandemic was going to be much longer than an extended spring break. My daily connection with my students was suddenly reduced to a distant email or occasional phone call. Most soberingly, my core beliefs as a music educator were suddenly challenged when the thriving band program I had worked so hard to build was declared "non-essential," and I was told to step aside so that other subject areas could be prioritized.[118]

Although MacLaine adjusted to the new normal of teaching band during the pandemic, the author states that a few aspects of the experience will continue to be used in post-pandemic teaching. The author states, "Most importantly, this pandemic has inspired my insightful realization that so many of those "carrots"—the performance tours, the music festivals, the band

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[115] Long, "The Instrument-Less Band Director," 144.

[116] Ibid., 146.

[117] Kirsten MacLaine, "Waiting for the Laughter," *Journal of The Canadian Band Association* 20, 1 (2021): 12.

[118] Ibid.

camps, and the concerts that I always thought were necessary to motivate my students to make music, are not as important to them as is the opportunity to simply make music, *together*."[119]

One common thought among the music educators who recounted their experiences at the outset of the COVID-19 pandemic is the lack of preparedness to teach a subject that had traditionally been taught in the same manner for an extended period but now required a different approach. Directors had to adjust to the new "normal," regardless of their preferences. This experience can be viewed as challenging to many educators in ways they might not have anticipated or known were possible.

A study by Vold discusses the impact on the motivation of both students and faculty when a Norwegian university had to quickly transition to online courses during the COVID-19 pandemic and subsequent lockdown. A survey found differences in learning outcomes between full-time and part-time students, with social isolation and lack of contact with peers affecting student engagement.[120] Many students kept their cameras turned off during online classes, which created challenges for instructors in encouraging participation and interaction, especially in group work environments.[121] Despite these obstacles, the university's faculty members persevered through the crisis, motivated by a sense of duty and the need to adapt to new tools and teaching methods.

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[119] MacLaine, "Waiting for the Laughter," 13.

[120] Tone Vold, Monica Lervik, and Stig Holen, "Teacher Motivation during the Corona Crisis, Facing "Black Screens" and Missing "Watercoolers"," *Academic Conferences International Limited* (2021): 512, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/conference-papers-proceedings/teacher-motivation-during-corona-crisis-facing/docview/2616898078/se-2.

[121] Ibid.

The study examined the theoretical foundations of work motivation, highlighting intrinsic and extrinsic factors that influence individual performance and engagement.[122] Psychological tools, such as communication and interaction, and material resources, including computers or devices, played a crucial role in engaging students.[123] The study concluded that technology tools like Zoom's breakout rooms helped reduce the feeling of isolation between instructors and students.[124] Moreover, collaboration among faculty members heightened motivation and support, stressing the importance of social learning and mutual support in overcoming the challenges of online education.[125]

Experiences After the Shutdown

Although teaching during the shutdown caused by the COVID-19 pandemic emerged as the most challenging period in one's teaching career, it also led to the establishment of some positive practices. In "Our Rebirth: Reshaping the Music Discipline after the COVID-19 Pandemic," Urkevich discusses positive aspects of music education that directly resulted from the COVID-19 shutdown. The author states, "In the short period since the global virus became a reality, we have seen some positive practices."[126] The first practice the author pointed out was the forced familiarity with technology. Music professors and instructors, many of whom spent

[122] Vold, "Teacher Motivation," 513-515.

[123] Ibid., 516.

[124] Ibid.

[125] Ibid., 517.

[126] Lisa A. Urkevich, "Our Rebirth: Reshaping the Music Discipline after the Covid-19 Pandemic," *College Music Symposium* 60, no. 1 (2020): 1. https://www.jstor.org/stable/26919801.

years avoiding a more significant interaction with technology, learned and became more comfortable with online methodologies, platforms, and applications.[127]

As a second point, Urkevich states that since music was being "increasingly experienced on an intimate, personal level, performed in homes, with a sole purpose of expressing feelings, lifting spirits, or challenging one's intellect and ability," music appreciation grew among the general population sparking a burst of creative energy with a "desire to connect with humankind."[128] In addition to pointing out positive practices due to the shutdown, the author recommends a practice that should be implemented for the future of music education. Concerning teaching music education in the future, Urkevich states, "For students to be successful into the 21st century, in higher academe, it is important that we begin to think holistically and break free from our legacy systems."[129]

Stinson's "Reflections on Lessons Learned During COVID-19: Re-envisioning Middle School Band Programs After COVID-19" highlighted a positive aspect—the impact of technology used during the shutdown on band directors' instructional methods.[130] According to Stinson, due to the abundant nature of the technology used, the band directors' instructional practices became more efficient with "assessments, communication, and feedback.[131] The study addressed and compared "the efficacy of standard practices amongst middle school band

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[127] Urkevich, "Our Rebirth," 1.

[128] Ibid.

[129] Ibid., 5.

[130] McKinley Stinson, "Reflections on Lessons Learned during Covid-19: Re-Envisioning Middle School Band Programs after Covid-19," (Doctorate Thesis, Liberty University, 2022): 95.

[131] Ibid.

directors before COVID-19 with responsive actions to limitations and restrictions by the pandemic according to secondary, collegiate, and administrative music personnel throughout the Southeast United States."[132] The study identified a need for "increased training on the technology used in the classroom, reprioritization of focus regarding students, music, and band, and additional opportunities for pre-service teachers to gain teaching experience."[133]

Technology Practices Used in Response to the Shutdown

Music educators creatively designed lessons using technology during the COVID-19 shutdown. Despite not being able to interact with each other to make music socially, music educators found ways, with the help of technology, to continue to make music with their students. A chorus instructor created virtual ensembles with high school chorus students to continue making music while working with them virtually. In the article "Creating Virtual Ensembles," Cayari discusses the benefits of creating a virtual ensemble and provides detailed steps. A virtual ensemble is defined as a "digital musical product that uses multiple recordings edited together to form a musical ensemble."[134] The process involves audio and video recording, where many applications could be used to complete the recordings.

Cayari describes three "creative dispositions" that music educators can reflect on when "making music and performing online."[135] First, Do-It-Yourself (DIY) involves one person recording themselves performing. The second disposition, Do-It-With-Others (DIWO), involves

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[132] Stinson, "Reflections on Lessons," 95.

[133] Ibid., 94.

[134] Christopher Cayari, "Creating Virtual Ensembles: Common Approaches from Research and Practice," *Music Educators Journal* 107, no. 3 (03, 2021): 38, http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholay -journals%2Fcreating-virtual-ensembles-commonapproaches%2Fdocview%2F2540415855%2Fse-2%3Faccountid%3D12085.

[135] Ibid., 40.

two or more people collaborating to create a project. Lastly, Do-It-For-Others (DIFO) is when group members are assigned tasks to complete the project. According to Cayari, "Larger virtual ensembles are usually crowdsourced and require a leader who establishes a vision and recruits people for the project. Musicians then record their parts, and sound engineers compile and edit the recordings."[136] This method is not exclusive to choral music education but can also be applied to instrumental music education.

When teachers could not instruct their students in the traditional face-to-face manner, they resorted to videoconferencing. In an article examining online education during the COVID-19 pandemic, Hernandez discusses the benefits of videoconferencing in instrumental lessons. The traditional pedagogy of teaching musical instruments faced challenges in transitioning to online education before the COVID-19 shutdown, unlike theoretical subjects that had successfully embraced digital methods years earlier.[137] According to Hernandez, "Zoom, Skype, Google Hangouts, Google Meet, Microsoft Teams or FaceTime apps" are among the most popular platforms for synchronous online teaching."[138] The author notes that the numerous advantages of using these platforms include international collaborations through live performances, masterclasses, and remote rehearsals.[139] Other technologies influencing a successful videoconference include microphones, signal processors, network routers, and output

[136] Cayari, "Creating Virtual Ensembles," 40.

[137] Ana Martínez-Hernández, "Online Learning in Higher Music Education: Benefits, Challenges and Drawbacks of One-To-One Videoconference Instrumental Lessons" *Journal of Music, Technology & Education 13,* no. 2&3 (2021): 182, https://doi.org/10.1386/jmte_00022_1.

[138] Ibid.

[139] Ibid.

devices such as speakers or headphones.[140] Hernandez states, "The combination of all these factors will make a big difference on the sound quality achieved during a videoconference."[141] While online learning removed the social interaction between teacher and student, educators used videoconferencing to supplement face-to-face lessons.[142]

In the study "Teaching Music Online: The Experience of Music Educators During Distance Learning," Silva investigated how orchestra and band teachers effectively engaged their instrumental music students in online teaching amid the COVID-19 pandemic. Silva conducted interviews with four middle school music teachers, each having a teaching experience of at least fourteen years before the onset of the pandemic. The author inquired about their experiences during the distance learning period prompted by COVID-19, their strategies to motivate their students, factors influencing student motivation, and their outlook on post-pandemic teaching.[143] Knowing the upcoming school year would be taught online, the participants planned during the summer of 2020 and prepared lessons using the following online resources: YouTube, Sight Reading Factory, Soundtrap, and SmartMusic.[144] The study revealed that "each participant was able to grow and develop in their use of technology in the music classroom, whether they learned on their own or received from (the) sort of formal training while applying pedagogical and music

[140] Martínez-Hernández, "Online Learning in Higher Music Education," 185-186.

[141] Ibid., 186.

[142] Ibid., 183.

[143] Rudy Silva, "Teaching Music Online: The Experience of Music Educators During Distance Learning," (Master's thesis, California State University, Long Beach, 2021), ii, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/teaching-music-online-experience-educators-during/docview/2648019290/se-2.

[144] Ibid., 67.

content knowledge that they previously had already attained."[145] Additional online resources that the participants used while teaching online were Google Chrome Music Lab, IncrediBox, Blooket, 8notes.com, EdPuzzle, Boom Cards, Rhythm Randomizer, MusicTheory.net, and Schoology.[146] Regarding how the participants envision using these resources in future teaching, Silva states that "all four educators have some strategies they will continue to utilize, including the digitization of class materials, as well as using resources such as YouTube and Sight Reading Factory in future contexts."[147]

Importance of Technology Learning in Professional Development and College Courses

The shutdown caused by the COVID-19 pandemic brought the realization of the importance of technology-based professional development for teachers and the need for a technology shift in the curriculum in collegiate teacher education programs. In "Soft-Digital Skills in Higher Education Curricula," Bastos examines the integration of soft-digital skills training into higher education curricula, driven by the need to adapt to the digital transformation that is shaping global professions in the 21st century. Bastos explains, "The main question is how pedagogies and the use of technologies have a meeting point where it is possible to continue humanization in education through the use of virtual environments to support the teaching/learning process."[148] The study highlights the central role of technology in promoting individualized learning experiences to improve student performance and effectiveness.

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[145] Silva, "Teaching Music Online," 68.

[146] Ibid., 46-54.

[147] Ibid., 73.

[148] Susana Bastos, Helena De Oliveira, Moreira Manuel Silva, and Liliana Azevedo. "Soft-Digital Skills in Higher Education Curricula," *Academic Conferences International Limited* (2019): 70, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/conference-papers-proceedings/soft-digital-skills-higher-education-curricula/docview/2317556438/se-2.

As future music educators prepare to teach in a technology-dependent society, universities face the challenge of preparing their students to thrive in a digital-centric world. Bastos states that "Universities must engage a new role in the preparation of their students to this new paradigm: their students are the ones that are in 'the forefront of today's information society.' In fact, the figures presented by the above-mentioned statistics reveal a need to change the way we see and work at the higher education sector."[149] The author defines the student of the future as the "student 5.0," which means the student has a certain level of proficiency in core competencies compared to digital competencies and human competencies.[150] The fusion of digital skills with fundamental core competencies defines Generation 5.0 and highlights the urgency for educational institutions to re-evaluate teaching methods and bridge the gap between traditional and digital environments in order to develop well-rounded individuals capable of excelling in a fast-paced, technology-driven environment.

In "Making Music Education Future-Ready," Kaschub discusses the roles that professional development and colleges play in preparing future music educators. After having time to reflect on the design of online learning, Kaschub shares that there is a difference between "emergency remote teaching" and "online learning."[151] The author further stated that when designing lessons in the future, educators should reflect on one question: "What are the absolute essential learnings for my music students regardless of the format in which their learning opportunities are delivered?"[152] Moreover, in preparing to plan flexibility in curriculum delivery,

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[149] Bastos, "Soft-Digital Skills," 71.

[150] Ibid., 74.

[151] Michele Kaschub, "Making Music Education Future-Ready," *Music Educators Journal* 106, no. 4 (2020): 19, https://www.jstor.org/stable/27000794.

[152] Ibid.

educators should build their technological expertise and improve their practice through purposeful professional development related to the use of technology.[153] The article concludes with the role that colleges have in preparing their future music educators. Kaschub states, "Colleges, too, are faced with new challenges. Teacher preparation programs are actively reviewing courses and figuring out how to deliver instruction addressing teaching methods for music education settings that have not previously existed."[154]

One resource educators found helpful in designing lessons to teach online was Podcasting. Weimer examined one novice music teacher's experiences using a self-created and produced podcast as a professional development tool.[155] According to Weimer, to become more connected and relevant to the classroom, professional development (PD) should include five key components: (a) content focus, or activities focused on subject matter; (b) active learning, or opportunities for teachers to engage in PD activities rather than passively listening to lectures; (c) coherence, or content that aligns with school curriculum and goals, teacher knowledge and beliefs, students' needs, and local and state policies; (d) sustained duration, or ongoing activities throughout the school year; and (e) collective participation, or groups of teachers from the same grade, subject, or school participating in activities to construct an interactive learning community.[156] The author states, "Music teachers need PD situated within a music education context, and relevant to daily classroom activities, goals, and objectives."[157] When school-

[153] Kaschub, "Making Music," 20.

[154] Ibid.

[155] Kristina R. Weimer, "An Intrinsic Case Study of One Music Educator's Professional Development Through Podcasting," *Contributions to Music Education* 46 (2021): 245. https://www.jstor.org/stable/27125940.

[156] Ibid., 246.

[157] Ibid.

offered PD does not provide applicable information to music teachers, they have online options such as online PD and Podcasts. Weimer explains the benefits of online PD, stating:

> Modern technologies, media tools, and web resources have provided new possibilities for teachers to examine their practice, network, and gain professional knowledge and development. Online PD is efficient, accessible, and interactive. It offers convenience, focuses directly on the learner, and aims for interactions and discussions allowing teachers to develop relationships that promote learning and apply new concepts in their classroom.[158]

Teacher-created online PD opportunities provide content-specific, inquiry-based, and tailor-made information based on teachers' needs, treat teachers as active learners while enhancing their pedagogical skills and knowledge, and sometimes include collaborative opportunities.[159]

Three themes emerged from the study: (a) the podcast contributed to increased motivation to improve as an educator, (b) it created an opportunity for the teacher to network with other educators around the world, and (c) it provided a resource for reflection.[160] Music educators can consider the following implications as outlined by Weimer in the article:

> Music teachers at all career stages should be empowered to choose and create types of PD that fit their needs and learning style. This can be cultivated in teacher preparation programs. Music teacher educators should integrate PD conversations into courses, taking time to let students reflect on their individual learning styles and perceived PD needs, then identifying potential ways to meet them. This may help them better reflect on inservice PD experiences, be able to identify what is lacking in their experiences, and create unique ways to obtain it.[161]

Music teachers' professional development should shift from a top-down approach to one where teachers play an active role in their growth. According to Weimer, "participating in

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[158] Weimer, "An Intrinsic Case Study," 246-247.

[159] Ibid., 247.

[160] Ibid., 252.

[161] Ibid., 259.

teacher-created PD honors teachers' needs, contexts, and experiences" while offering opportunities to "connect and collaborate" and sparking a desire for continued development and increased dedication to the education profession.[162] Utilizing podcasts as a form of PD should be explored, along with creating tailored opportunities to meet music teachers' specific needs.

Furthermore, participating in professional development and undergraduate courses focused on integrating technology into teaching increases digital literacy. Before supporting teachers' professional development, those responsible for providing it must understand educators' digital literacy.[163] According to Rahmawati, digital literacy is a "fundamental skill for teachers to integrate into the teaching-learning process."[164] In a study by Rahmawati et al., the authors explored secondary teachers' digital literacy. They deciphered the most suggested ways of enhancing their digital literacy from the past five years of research.[165] The systematic review of 118 articles found the most suggested ways of enhancing teachers' digital literacy, digital research trends from the past five years, and the various levels of digital literacy in secondary teachers.[166] Concerning the multiple ways teachers' digital literacy can be enhanced, the authors explain:

> There are several strategies to enhance teachers' digital literacy. However, the most suggested way is to conduct a further training program, which could be organized by the school or governance. Additionally, other ways of leveraging teachers' digital literacy in secondary schools are by providing study programs or related courses for the teachers, requiring teachers to practice working with application systems used in online learning, such as the learning management system, having digital regional school agendas, implementing an educational video game for developing teachers' digital literacy, and

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[162] Weimer, "An Intrinsic Case Study," 259.

[163] Rahmawati, "Teachers' Digital Literacy Overview," 603.

[164] Ibid., 597.

[165] Ibid.

[166] Ibid., 600-602.

> conducting the standardized evaluation which could certify the teachers' digital literacy.[167]

Regarding research trends, the authors found that the growth of digital literacy research began within the last five years, with a spike in the year 2019 when the shutdown caused by COVID-19 began.[168] Lastly, the researchers found that the average level of digital literacy discussed in the articles investigated was intermediate (17 articles), followed by advanced (7 articles), and basic (3 articles).[169]

In *Professional Development Approaches for Digital Scholars: Taking Ownership of Your Professional Learning,* Strydom addresses continuous professional development for the digital scholar. The chapter covers a summary of practices, dimensions of professional development, factors influencing decisions for engaging in development, and techniques to demonstrate learning through critical reflection and digital portfolios. Because of the "ever-evolving nature of digital technologies," Strydom states that "engagement with digital technology, and then specifically digital scholarship, is an ongoing journey which cannot be limited to once-off or reductionist approaches that only focus on the use of digital tools in scholarly work."[170] The author emphasizes the importance of continuous professional development stating that in the field of educational technology, one of the "key learnings" is that "learning never stops."[171]

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[167] Rahmawati, "Teachers' Digital Literacy Overview," 600.

[168] Ibid., 601

[169] Ibid., 602.

[170] Sonja Strydom, et al., "Professional Development Approaches for Digital Scholars: Taking Ownership of Your Professional Learning," *Evolving as a Digital Scholar: Teaching and Researching in a Digital World*, 137, Leuven University Press, 2021, https://doi.org/10.2307/j.ctv20zbkk0.11.

[171] Ibid.

Moreover, Strydom discusses the three dimensions of continuous professional development. The first dimension is the desire to gain insight and understand various tools and approaches related to digital technology, emphasizing digital knowledge. The second dimension includes considering pedagogical approaches in the context of digital technologies, focusing on pedagogical knowledge. Finally, the third dimension involves identifying and evaluating potential avenues for additional learning opportunities that serve as vehicles for further knowledge development.

Figure 1. Typology of free web-based digital technologies[172]

(*Removed to comply with copyright*)

[172] Strydom, et al., "Professional Development Approaches for Digital Scholars" *Evolving as a Digital Scholar: Teaching and Researching in a Digital World*, 140, Leuven University Press, 2021, https://doi.org/10.2307/j.ctv20zbkk0.11.

One way to begin professional development is to ensure a solid overview of the available tools and approaches.[173] Figure 1, developed by Bower and Torrington, presents a useful typology of accessible online tools that could be used in educational practices.[174] By understanding available options, individuals can make informed choices on where to expand their knowledge and skills in various digital technologies. Strydom states, "The typology demonstrates the necessity to gain an overview of what is available and then to make informed decisions about how and where you would like to gain further knowledge and experience in these approaches and tools."[175] Criteria were established for selecting tools, including being free and not just a trial, accessible through web browsers, offering collaboration options, and being suitable for educational use.

Concerning pedagogical approaches associated with digital technologies, the author explores the integration of digital tools into teaching practices, offering both macro and micro levels of technology integration. At the macro level, the goal is to revamp an entire module by incorporating digital technologies thoughtfully aligned with course outcomes.[176] At the micro level, starting small with a specific tool like Kahoot can enhance engagement through in-class digital responses, requiring careful selection of tools and educational integration within the module.[177] Strydom also discusses the importance of aligning digital tools with learning theories

[173] Strydom, "Professional Development Approaches," 139.

[174] Ibid., 140.

[175] Ibid.

[176] Ibid., 143.

[177] Ibid.

and considering how they can enhance learning and assessment activities, providing educators with practical guidance on incorporating technology into their teaching practices.[178]

Next, the author discusses the aspects associated with digital technology use, stating, "There are a wide range of factors impacting whether we will engage with continuous professional development as digital scholars. Such factors could be complex, multifaceted and context-specific."[179] The three aspects Strydom discusses are human factors, such as agency and motivational factors; human action, which can be self-directed and self-regulating learning; and knowledge application, which involves reflection and putting together e-portfolios.[180]

Concerning human action and digital technology, the author highlights two learning initiatives (self-directed and self-regulating learning) that one may embark on when pursuing professional development. Self-directed learning is when the learner has the skill to design a learning environment that is appropriate for their learning needs, and self-regulated learning consists of forethought, performance, and self-reflection and is an approach that one can adopt when focusing on a clearly defined goal or task.[181]

Lastly, Strydom discusses the critical step of applying newly acquired knowledge in educational contexts, emphasizing the value of reflection and sharing through e-portfolios. The author explores different types of portfolios, such as teaching portfolio and reflective portfolio, as tools for documenting professional growth and learning experiences.[182] The author concludes the chapter by summarizing the importance of embracing continuous professional development

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[178] Strydom, "Professional Development Approaches," 143.

[179] Ibid., 147.

[180] Ibid.

[181] Ibid., 151-152.

[182] Ibid., 153-155.

as an ongoing journey for digital scholars, tailored to individual needs and institutional contexts, and underscoring the significance of self-awareness in effectively navigating the digital landscape.

Summary

This literature review provided information related to music educators' experiences and their experiences with teaching with technology during the COVID-19 shutdown. In addition, the literature supported the importance of using technology in the classroom and the expectation of technology use in music education. Even though technology had been incorporated into music classrooms before the onset of the COVID-19 pandemic, the swift transition from in-person to online learning revealed the stark reality of how underutilized technology was in instrumental music education.

The distinction between digital natives and digital immigrants and the implications of this distinction for education were discussed. The literature review highlighted the differences between people who grew up around technology (digital natives) and people who adapted to technology later in life (digital immigrants), emphasizing how these differences affect teaching and impact learning. The need for educators to understand and adjust to the learning preferences and cognitive processes of digital natives was emphasized, along with the importance of fostering digital literacy in both teachers and students. Additionally, the literature explored strategies for bridging the gap between digital natives and digital immigrants in educational settings, emphasizing the importance of mutual learning, collaboration, and understanding.

Furthermore, the literature review on technology in the classroom demonstrated the significant impact and potential benefits of integrating technology into educational environments, particularly in music education. It emphasized how technologies such as

YouTube, BYOD policies, and digital curricula can improve teaching and learning experiences for both teachers and students. Several ways in which technology can be leveraged were highlighted, such as using YouTube for instructional videos, BYOD policies for greater student engagement, and digital curricula for personalized learning experiences. The literature also highlighted the importance of overcoming barriers to successful technology integration, such as access to resources and appropriate professional development, while providing examples of successful implementation and associated positive outcomes.

The Housewright Declaration emphasizes the importance of music educators being familiar with and using technology to advance music study. The central theme of the literature was the significance of technology in shaping the future of music education. Subsequent discussions by McCarthy and Lehman highlighted the evolving role of technology in music education and emphasized its potential to transform teaching and learning processes while underscoring the continued importance of educators in directing and facilitating these changes.

Regarding the impact of the COVID-19 pandemic on music education, particularly concerning teaching practices and the use of technology, the literature highlighted the challenges music educators faced during the shutdown, such as the transition to distance learning and the limitations of technology and the loss of traditional teaching methods. It also discussed the positive aspects that emerged from the pandemic, including greater familiarity with technology, creative adaptations to continue music-making, and the development of new teaching strategies. Overall, the literature emphasized the resilience and adaptability of music educators in response to the unprecedented challenges of the pandemic.

The final section of this literature review discussed the imperative role of technology learning in professional development and higher education courses, particularly in response to

the challenges posed by the COVID-19 pandemic. The literature highlighted the need for educators, particularly future music educators, to adapt to a technology-dependent society by integrating digital skills into higher education curricula. It emphasized the importance of individualized learning experiences, connecting digital skills with core competencies, and the urgency for educational institutions to bridge the gap between traditional and digital environments. Additionally, it highlighted the importance of targeted professional development, online learning opportunities, and improving teachers' digital literacy to meet the demands of a fast-paced, technology-driven world.

The COVID-19 shutdown forced music educators to teach their subjects untraditionally using technology. In their efforts to offer meaningful and engaging music lessons, educators discovered the value of online resources that could continue to enhance the classroom experience when schools return to in-person learning. To surpass the standards outlined in the Housewright Declaration, music educators should persist in incorporating technology into their teaching methods.

Chapter Three: Methodology

Introduction

Before the COVID-19 shutdown, technology had a limited presence in daily band lessons. The shutdown's aftermath created a shift in instrumental music education, with technology becoming integral to daily instruction in the band classroom. The onset of the COVID-19 pandemic forced music educators to turn to technology to continue teaching performance-based subjects, such as band, chorus, or orchestra. School districts mandated virtual teaching for the remainder of Spring 2020. While music teachers innovated with new technological strategies for virtual instruction, continuing with these approaches may also enhance face-to-face classroom teaching. This chapter provides an overview of the methodology used in this study by discussing the research design, research questions, and the hypotheses that guided the research. In addition, the scope of the study, selection of participants, instrumentation, and study procedures are discussed in this chapter. This chapter concludes with the researcher's data analysis plan.

Design

This study will employ a qualitative research design as the researcher will review relevant literature and gather data through interviews with band directors who taught in Cedar Hill ISD during the COVID-19 shutdown. Creswell and Creswell identify the natural environment and the researcher as essential elements in qualitative research.[183] The researcher received approval from the Liberty University Institution Review Board (see Appendix A), the thesis chair and reader (see Appendix B), and the Cedar Hill Independent School District (see

[183] John Creswell and J. David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (London: SAGE, 2018), 181.

Appendix C). To recruit participants, phone calls and emails were sent explaining the purpose of the study and the eligibility requirements. The researcher will establish an interview time and location once invitees agree to participate in the study. After the interview, an audio recording transcription will be created and analyzed to explore and answer the research questions and hypotheses.

Questions and Hypotheses

The following research questions and hypotheses guided this study:

Research Question 1: What types of technology were used by middle and high school band directors in the residential classroom before the COVID-19 pandemic in Cedar Hill, Texas?

Hypothesis 1: The types of technology used by middle and high school band directors in the residential classroom before the COVID-19 pandemic in Cedar Hill, Texas, were limited to videos, online tuners, and SmartMusic.

Research Question 2: What technological challenges were faced by middle and high school band educators during the COVID-19 pandemic in Cedar Hill Independent School District?

Hypothesis 2: Technological challenges that were faced by middle and high school band educators during the COVID-19 pandemic in Cedar Hill ISD included online teaching issues, students not having devices to access lessons, and trying to find ways to keep students engaged.

Research Question 3: What new technologies were used during the COVID-19 pandemic and continued to be used in the classroom post-pandemic in Cedar Hill Independent School District?

Hypothesis 4: New technologies used during the COVID-19 pandemic that continued to be used in the classroom post-pandemic in Cedar Hill ISD include online rhythm studies, SmartMusic, online band method books, and related YouTube content.

Participants

The researcher recruited middle and high school band directors in the Dallas-Fort Worth area by making phone calls or sending email messages explaining the purpose of the study and the requirements for participating in the interview. Participants for this study included band directors in Cedar Hill ISD who taught before, during, and after the shutdown caused by the 2020 pandemic. Each band director held secondary music teaching certifications from the State of Texas. The teaching experience of the participants ranged from five to twenty years of experience. The participants consisted of four middle school directors and three high school directors. The researcher replaced each participant's name with a pseudonym to protect their identity and ensure anonymity.

Setting

The study was conducted in a southwest Dallas, Texas, urban school district. The researcher conducted individual meetings with each participant to discuss and record responses to the ten interview questions. Interviews took place at the participant's work office or home. The entire interview process took twenty to thirty minutes.

Data Collection Method

The data collection for this study was designed to address the specific research questions and provide a comprehensive understanding of the impact of technology on middle and high school band programs, especially in the context of the COVID-19 shutdown. The research

questions were structured to allow a comparative analysis of traditional practices concerning technology usage in band programs before, during, and after the pandemic-induced shutdown. Additionally, the questions addressed the directors' experiences transitioning to online band instruction and assessed their readiness to utilize technology.

To gather in-depth insights, a research questionnaire consisting of ten open-ended questions was developed (see Appendix D). These questions were strategically designed to elicit detailed and nuanced responses from the participating band directors. The open-ended format allowed directors to articulate their experiences, challenges, and perspectives comprehensively. By employing this approach, the study aimed to capture a rich dataset that would facilitate a thorough exploration of directors' perspectives and experiences during various phases of the COVID-19 pandemic, shedding light on the evolving role of technology in band instruction.

Procedures

This study required Liberty University's Institutional Review Board (IRB) approval to work with human subjects. The researcher submitted the proposal for this study to the IRB for approval on March 18, 2023. The IRB approved the study on April 21, 2023, after reviewing the research design, interview questions, and other documentation. With permission from the IRB Committee, the investigator applied for approval from Cedar Hill ISD's IRB to conduct research with the directors in the district. The researcher contacted participants once Cedar Hill ISD's IRB approved the study. The participants meeting the inclusion criteria were identified and contacted via telephone, requesting their participation in the study. To meet eligibility criteria, participants were required to be band directors who taught before, during, and after the shutdown in Cedar Hill ISD caused by the COVID-19 pandemic of 2020. Once participants agreed to participate, interview times were scheduled as agreed between the researcher and the participant.

At the beginning of the interview, participants were given two copies of the terms of participation. The participants signed and returned one to the researcher and kept the second copy. The interview consisted of ten questions (see Appendix D). Each interview was audio recorded. The researcher also took notes during the interviews. Interviews ranged between thirty and fifty minutes. Once the participant answered all ten interview questions, the interviewer convened the interview after allowing the participant to share any additional comments. After completing all interviews, the researcher transcribed the information contained in the audio recording and began preparing for data analysis.

Researcher Positionality

As the principal investigator for this study, the researcher acknowledges the influence of their background and experiences on the research process. The researcher is a band director with 23 years of experience, which has shaped their understanding of music education and technology integration. The researcher's role as a band director in Cedar Hill ISD provided them with insights into the challenges music educators face, particularly during the COVID-19 pandemic.

Having engaged with YouTube videos, music theory websites, and beginning band, the researcher brings a nuanced perspective to this study. The researcher's experiences may influence the formulation of research questions, data interpretation, and the identification of key themes. Additionally, as someone faced with teaching band during the COVID-19 pandemic, the researcher recognizes the potential for bias and strives for reflexivity throughout the research process.

Throughout this process, the researcher is committed to maintaining transparency and rigor in this study. While their positionality may shape their approach, the researcher aims to mitigate bias through reflexivity, peer debriefing, and triangulation of data sources. The

researcher encourages readers to consider the contextual lens through which this research is conducted. This acknowledgment of positionality is necessary for understanding the potential impact of the researcher's background on the study, promoting transparency, and contributing to the overall validity of the research findings.

Data Analysis

This study employed Microsoft Excel and MAXQDA. In preparation for the data for analysis, the researcher created digital copies of the participant's audio recordings. The researcher transcribed data from the interview field notes and audio recordings and put them into Excel to produce a spreadsheet. The Excel spreadsheet was then imported into the MAXQDA software to code data— MAXQDA's analysis of the data provided code categories, themes, and sub-themes. In addition, the researcher examined coded categories to identify themes in the participants' responses.

Summary

This chapter outlined the methodology employed for investigating the influence of technology on middle and high school band programs, especially considering the COVID-19 shutdown. The study's qualitative design, ethical considerations, participant selection, and data collection methods were carefully outlined. The qualitative research design, per the principles outlined by Creswell and Creswell, sought to gain a thorough understanding of music educators' experiences. Ethical approvals were obtained to protect participants and maintain research integrity.

Structured research questions and hypotheses guided the investigation, focusing on technology usage across different pandemic phases. The participant pool, comprising middle and high school band directors in Cedar Hill ISD, provided diverse perspectives in an urban setting.

Using ten open-ended questions, the data collection method was designed to extract detailed insights, allowing participants to articulate their experiences thoroughly. Rigorous procedures, including IRB approvals, participant recruitment, and interviews, were implemented, emphasizing transparency and ethical conduct.

Acknowledging the researcher's positionality highlighted potential biases and ensured transparency throughout the study. The subsequent data analysis, involving transcription, coding, and thematic identification, will provide rich insights into the impact of technology on band programs during the unprecedented challenges of the COVID-19 pandemic. In essence, this comprehensive methodological approach positions the study to make a meaningful contribution to the understanding of technology's role in music education, especially in the context of the pandemic's evolving challenges.

Chapter Four: Research Findings

This study aimed to explore how the use of technology changed the instruction of band methods during and after the shutdown caused by the COVID-19 pandemic. This chapter provides research findings on how middle and high school band directors plan, teach band fundamentals, and rehearse their ensembles by incorporating technology into their daily routines. While this study focuses only on the manner of instruction of band methods, the performing aspect of band, such as rehearsals and concerts, is another component of teaching band during the COVID-19 pandemic that band directors had to address.

Participants

Band directors from middle and high schools teaching at Cedar Hill ISD schools before, during, and after the shutdown of the COVID-19 pandemic were employed for this study. The participants' related work experience varied from six to sixteen years of relevant experience. Three directors worked with the same high school band program, with over 250 students enrolled in band classes at the pandemic's start. One director served as the middle school's head band director, with almost 200 students in band classes. Four band directors participated in interviews by answering ten lengthy interview questions. Three directors graduated from the same historically black college and university, while one graduated from a diverse university in Texas. All four participants were men and identified as African Americans.

After completing the interviews, participants completed a survey to create a profile linked to their responses.

Educator 1: African American male, B.M., board-certified music educator, six years teaching experience, served two years in Cedar Hill ISD as head middle school band director,

and his principal instrument is the trombone. Educator 1 is originally from Georgia, attended college in Texas, and currently resides in Texas.

Educator 2: African American male, B.M., board-certified music educator, six years teaching experience, served all years in Cedar Hill ISD as assistant high school band director and percussion instructor of the marching band, and head director of the sub-non-varsity level concert band. His principal instruments are clarinet and percussion. Educator 2 is originally from Houston, Texas, attended college in Louisiana, and resides in the Dallas-Fort Worth area in Texas.

Educator 3: African American male, M.M.E., board-certified music educator and fine arts administrator, sixteen years teaching experience, served eight years in Cedar Hill ISD as head high school band director of the marching band and varsity level concert band; his principal instrument is euphonium. Educator 3 is originally from Louisiana, attended college in Louisiana, and currently resides in Texas. Educator 3 supervises all music educators in the Cedar Hill School District.

Educator 4: African American male, B.M., board-certified music educator, sixteen years of teaching experience, served five years in Cedar Hill ISD as associate high school band director and head director of the non-varsity level concert band; his principal instrument is the tuba. Educator 4 is originally from Mississippi, attended college in Louisiana, and resides in Texas.

Research Question One

Research Question One: What types of technology were used by middle and high school band directors in the residential classroom before the COVID-19 pandemic in Cedar Hill, Texas?

Question 1 from the survey used to gather the data for this research study directly answers RQ1. The survey question asked, “Prior to the shutdown, how were you using technology in your class (daily class routine) to communicate with your students/parents and to plan your lessons?” Table 1 lists the types of technologies and applications the participants were using before the shutdown caused by COVID-19. The questions asked of band directors who qualified and participated in the survey are listed in Appendix D.

Table 1: Technologies Used by CHISD Band Directors before COVID-19 Pandemic

Technologies Used For	Types of Technologies and Applications
Instruction	Harmony Director Manual Tuner Metronome Overhead Projector Sight-reading Website (sightreadingfactory.com) SmartMusic Tuning Application
Communication	Band app (Social Application) CHARMS Email Remind101
Planning/Lesson Planning	Google Drive Google Sheets Microsoft Word

Technology was used for instruction, communication with students and parents, and lesson planning by all participants. For instruction, the harmony director, manual tuner, and metronome were used in class to prepare to rehearse music as a whole group. The overhead projector and sight-reading website were used during the instruction of music theory. Regarding communication, email and Remind101 were used by the middle school director mainly to communicate with parents, while the high school directors used CHARMS and Band app to

communicate with students and parents. In preparation for planning their lessons, all participants used the district-provided Google Sheet to develop their lesson plans and stored them in their district-provided Google account in Google Drive.

Technology for Instruction

All participants reported using a harmony director, manual tuner, metronome, and tuning application as part of their daily class routine. Two participants, both high school directors, used an overhead projector in conjunction with the sight-reading website www.sightreadingfactory.com. Only one of the high school directors used SmartMusic as part of their classroom instruction. Table 2 shows the technology used for instruction.

Table 2: Technology Used for Instruction

Type of Technology	Number of Educators Using
Harmony Director	4
Manual Tuner	4
Metronome	4
Overhead Projector	2
Sight-reading Website (sightreadingfactory.com)	2
SmartMusic	1
Tuning Applications	4

When responding to the survey question, Educator 2 gave a detailed account of how they used technology in the classroom prior to the shutdown, stating, “We start off every single day with droning two notes on our harmony director hooked up to the audio system in the band room. Students would hear that, and they know it’s time for class. They would tune their instruments to the notes.”

Technology for Communication

All participants reported using email through their work accounts or CHARMS to communicate with the parents and students. In addition to using CHARMS to send out mass emails, one director used a social media type application called Band app to communicate with parents and students. Through the Band app, parents and students received notifications on their phones when the director posted information on the application. Table 3 shows the technology used for communication.

Table 3: Technology Used for Communication

Type of Technology	Number of Educators Using
Email	2
CHARMS	3
Band app	1

The participants shared how they used technology when communicating with parents and students. Educator 1 stated, “The biggest thing I really use it for was communication. I would always contact the parents through email.” Additionally, Educator 2 stated, “At the beginning of the school year, we have our first band parent meeting. We have all the parents sign up their kids in our charms office system. With the information, we have the students’ email, the parents’ email—all their contact information, so when we log in on the educator side, we’re able to send out whatever communications need be.”

Educator 3 responded, “Communication was the biggest thing, and that was through email. I sent out emails to the parents, sent out emails to the students, and I also used the Band app. And that was for communication-wise, just to keep them up to date with upcoming events and newsletters.”

Technology for Planning

Google Sheets, Google Drive, or Microsoft Word were used by all of the directors to put together their lesson plans. Lesson plans were drafted using Google Sheets or a Word document, submitted to their building principals, and stored on Google Drive. Table 4 lists the technology used for planning.

Table 4: Technology Used for Planning

Type of Technology	Number of Educators Using
Google Drive	4
Google Sheets	4
Microsoft WORD	2

The participants were asked how they use technology for planning. Educator 4 responded, “Far as lesson planning, I didn’t really use tech. Well, I mean, of course, your word processor or WORD to type up my lesson plan, that was pretty much it.” Educator 1 stated, “As it pertained to planning, I would use it very little, and that’s just in a sense of going back and looking at what we’ve already done. In years prior, I did try to take pretty copious notes about what I had done.”

Research Question Two

Research Question 2: What technological challenges were faced by middle and high school band directors during the COVID-19 pandemic in Cedar Hill Independent School District?

Questions 3 and 10 from the survey used to gather the data for this research study addressed Research Question 2. Question 3 addressed the preparedness of the directors when attempting to continue teaching band online. For three of the four directors in the study, being

prepared was the first challenge of teaching online. Based on the responses, the three directors unanimously scored themselves a two out of ten on preparedness to teach band online.

Question 10 asked, "What are your negative takeaways from this experience?" Responses to Question 10 that are applicable to Research Question 2 are discussed in the following section. One of the technological challenges that Educator 4 discussed was the ability to hear all students online play at the same time. Educator 4 stated that the different internet speeds, reaction times, and delays prevented the students from being able to be heard playing the same section of music at the same time. The educator explained:

> They couldn't play at the same time with the (different) connections. That would be the only negative thing. And, of course, we tried, like the first couple of times, mainly trial and error. I was like, oh, you can't really do that because maybe it's my computer. Maybe we can do two at a time. Sometimes, you can do like two at a time, but anytime it was more than three or four, it just never worked because of the different internet speeds. If the internet was just one big system, everybody had the same speed; maybe it would work.

Educator 3 mentioned that sound quality made it difficult to correct mistakes the students may have made. When discussing the technological challenges faced while teaching online during the COVID-19 pandemic, Educator 3 explained, "You really didn't know how much kids were rehearsing or practicing on their own. Then, you couldn't correct certain things again because of the sound of what was displaying over the screen."

Research Question Three

Research Question 3: What new technologies were used during the COVID-19 pandemic and continued to be used in the classroom post-pandemic in Cedar Hill Independent School District?

Several questions from the survey used to gather the data for this research study addressed Research Question 3. Questions 2, 6, 7, and 8 addressed the type of technology the directors used in response to the shutdown to attempt to continue teaching quality lessons online, which technologies were most liked among the directors and students, and what technological strategies continued to be used after the pandemic. Table 5 lists the types of technologies and applications the participants used during and after the shutdown caused by COVID-19. The questions asked of band directors who qualified and participated in the survey are listed in Appendix D.

Table 5: Technologies Used by CHISD Band Directors after COVID-19 Pandemic

Technologies Used For	
Instruction	BEAM Google for Education Applications Harmony Director Metronome Music Theory Website (MusicTheory.net) Overhead Projector Sight-reading Website (sightreadingfactory.com) SmartMusic Tuning Application YouTube
Communication	Band app (Social Application) CHARMS Email Google Classroom Google Meet Schoology
Planning/Lesson Planning	BEAM Google Sheets Microsoft Word Schoology YouTube

Technology Used to Deal with Sudden Change

Survey Question 2 addressed the type of instructional technology the directors used in an effort to continue teaching Band while virtual. Table 6 lists the technologies mentioned during the interviews and the number of educators who provided a specific response.

Table 6: Technology Used for Instruction in Response to the Shutdown

Type of Technology	Number of Educators
Essential Elements Interactive	1
Google Classroom	4
Google Drive	2
Google Meet	2
Google Docs	1
Kahoot	1
MusicTheory.net	1
Online Metronome	1
PDFs on Google Drive	2
Recording Applications	3
Recorded Videos (YouTube)	1
Schoology	4
SightReadingFactory.com	1
SmartMusic	2
Zoom	3

Instruction

In the interviews, the educators explained how the technologies mentioned were used in the virtual classroom.

Google Classroom/Schoology

Google Classroom and Schoology were the learning management systems selected by the district for its teachers to use when teaching online. According to the educators interviewed,

Google Classroom was utilized to finish the 2019–2020 school year. When the 2020–2021 school year started, the district was using Schoology. Educator 3 explained in their interview that Google Drive was used with Google Classroom to provide the students with the sheet music needed for assignments. Educator 1 shared that it was their first time using Google Classroom, which allowed them to better understand how to use Google Drive. The educator stated, “So when we were virtual, we utilized Google Classroom. When using Google Classroom, you really understood the function for Google Drive. That’s the first time I’ve ever really used that (Google Classroom).”

Google Meet/Zoom

Google Meet and Zoom are virtual conference applications that allow users to meet online through video. Through Google Classroom, users can set up conferences directly through Google Meet. Zoom, on the other hand, is a separate virtual conference application that allows educators to send a link with a code through email for students to use to gain access to the virtual conference room. The educators explained how they used the virtual conference applications. Educator 1 stated, “And so the kids would zoom in (Google Meet), and with that, it was a hit or miss; some kids would, some kids wouldn’t. But before that, especially the beginners, I would just check in on them.” Educator 3 stated, “So if I went over measures 13 through 25 on the live Zoom class, they sent those measures to me individually by the end of the day as an assignment. Educator 4 responded, “I would have all the kids on mute, but one kid I selected, and we clapped the rhythm. I couldn’t tell if everybody else was right; they had to be … if you got 100% right, raise your hand. So you’ll see the li’l hand come up.”

MusicTheory.net/Sight Reading Factory

MusicTheory.net and Sight Reading Factory are websites the participants used as instructional tools during virtual learning. Educator 1, a middle school director, mentioned that they used MusicTheory.net to teach students line and space names for the students' respective clefs. Two participants explained how Sight Reading Factory was used to reinforce rhythm reading. Educator 3 expressed, "As far as going through fundamentals: basic fundamentals, rolling on to sight reading, then rolling on to Ensemble skills. Sight Reading Factory was used to incorporate sight reading practice." Educator 4 stated, "We still do rhythm of the day, but we use it with the Sight Reading Factory, so I don't have to write out the rhythm; the computer automatically generates (the rhythm)."

PDFs on Google Drive/Google Docs

PDFs were used as electronic versions of worksheets. On an existing worksheet, teachers could insert text boxes in the answer sections, allowing students to type in their answers. PDFs were also used to share sheet music with students for music study. However, Educator 1 shared they preferred using Google Docs over PDFs. Google Docs was used similarly. When students were completely remote, Educator 1 shared about using Google Docs as a virtual sticker board, stating, "We had a virtual sticker board. Those are really big (with the kids). We created those on Google Docs so we could kind of put little stickers there for the kids, and they could all see their progress work through this stuff."

Recording Applications

Recording themselves playing allowed students to work at their own pace and time. Educator 4 shared that the recordings were used as assignments for students at the beginning of

the shutdown. The educator stated, “That was the only assignment. I thought this was like a one-month thing. I didn’t really understand the dynamic of a pandemic.” Educator 2 explained in detail how the recordings were used for the assessment of music study during remote learning, stating:

> I had assignments—excerpts of different pieces—that we would play, and the students would record themselves individually. They would play it and then turn it into me. They will send it to me, and then that's how they would turn in their assignment. I would say, “We’re gonna start from the beginning, and let’s go all the way down to rehearsal number 23.” I would assign different sections, of course, for different instruments. I would explain, like, “I need all woodwinds with bass clarinet. You’re from the beginning to measure 23. Low brass, I need (to hear) you from measures 27 to 32. I need to hear that section right there. Tubas, I need to hear that phrase right there at measure 41. Just measure 41; I need to hear you a lot.” You know, things like that. I would delegate those through my score study, of course, those certain sections. Yeah, students would turn those assignments in.

Educator 3 shared that students would record videos of themselves playing specific parts of the music they were studying in class and upload the videos on Google Drive or email the videos directly to the educator. The recordings would be used as assignments.

SmartMusic/Essential Elements Interactive

Smart Music is a program that allows users to listen to an entire piece or individual part of music while showing the score or sheet music. The program also allows users to record themselves playing the excerpts and provide immediate feedback on playing accuracy. At the beginning of the pandemic, Smart Music allowed music teachers to create accounts and use its products at no cost to the teachers or students. The educators shared how they used Smart Music to teach remotely. Educator 3 shared, “Depending on what songs that we played, I would use those songs on smart music to try to get students to have an idea or recording, and they can play along with it and learn a little faster.” Educator 4 stated, “Also, what we used was SmartMusic.

We would go through the music, although the kids were muted. We'll play through the music and stop the recording, and I said, 'Please, one at a time. Let me hear you at measure 13.' Because if they did it at the same time, it wouldn't work. Just because of the way the computer was synced up."

Included with the purchase of the Essential Elements Band Method book, the Essential Elements Interactive (EEI) online program is a simple set of technological tools for online learning, teaching, assessment, and communication. According to the Essential Elements' website, the teaching tool is "ideal for teaching today's band and string students both in the classroom and at home."[184] Students would have their method book to play out of and could play their exercises out of the book along with the music tracks provided online through the Essential Elements website. Educator 1 discussed how they used the program for online instruction, stating, "We implemented a little bit of the essential elements online, which was really, really fun because the kids could pick their little background. And so they could pick to play along with, a pop background or a country background; it was fun for the kids, so it made it fun for me."

Once students returned to in-person learning, the program was used in class during synchronous instruction. According to Educator 1, students also continued to use the online component for at-home practice.

Planning

Due to the unplanned nature of having to teach the remaining year online, educators had to create new material and techniques to continue teaching band. Educator 1 stated that they researched a lot of YouTube videos to find useful ideas to implement in their own instruction.

[184] "Interactive," Essential Elements Website, visited October 15, 2023, https://www.halleonard.com/ee/interactive/#:~:text=EEi%20is%20an%20easy%20set,an%20Essential%20Elements%20Method%20Book.

Educator 2 discussed being a part of several teacher groups on Facebook to get ideas for teaching online. Educator 3 also mentioned using teacher groups in addition to asking other colleagues. Educator 4 shared asking around and utilizing numerous band director forums. All four educators mentioned attending virtual conferences held by groups such as the Texas Bandmasters Association (TBA), Conn-Selmer, and Minority Band Directors National Association (MBDNA). The following is a synopsis of how the educators answered in their interviews when asked how they prepared to teach online.

Educator 1 stated, “Minority band directors (MBDNA) started doing virtual conferences, and they would teach you, and we’d actually get all on Zoom calls. They would have clinicians come on and talk to us about stuff. Educator 2 shared:

> I’m in several different Teacher groups on Facebook, so relying on my fellow educators from different states, even the ones in Texas, I kind of piggybacked on a lot of the things that they were doing kind of okay with. It was a collaborative effort in the educational space to keep our students engaged even as fine arts band teachers. This teacher was doing this; it worked for their students to keep their students engaged because engagement with the heaviest thing that we were relying on during the pandemic, the students being engaged and wanting to log in online and participate in the class, so that and YouTube was another thing. A lot of teachers were posting assignments or lessons via YouTube. So, I would either borrow, if you would, those same lessons, or use the same lessons and tweak it myself to kind of make it more rigorous for high school. But definitely reaching out to other educators via Facebook and doing kind of some research on my own on YouTube to kind of see what everyone else was doing.

Educator 3 answered, “Videos and different colleagues; just kind of observed and ask around what would they be using for their students, and then I tried to find the best thing that was for our students.” Educator 4 stated, “Asking around. Um, there’s tons of band director forms. During that time when people were like, ‘What are you doing?’ because everybody was just kind of scrambling to figure out what are you doing to keep your kids engaged.”

Best Technology Strategies Found

For Educators

Table 7: Favored Technology for Educator Use

Type of Technology	Number of Educators
Essential Elements Interactive	1
Google Classroom	2
Recording Apps	3
Schoology	4
Schoology for Quizzes	2
SmartMusic	2
Virtual Sticker Chart	1
Zoom	2

Educator 1, a middle school director, found the Essential Elements Interactive and virtual sticker chart to be the most useful online tools for teaching online. According to the educator's interview, the virtual sticker chart gave students a visual of their progress and motivated them to complete the learning tasks provided by the director. Using EEI in conjunction with the Essential Elements Band Method Book allowed Educator 1 to continue teaching according to an already established band curriculum. Through EEI, Educator 1 was able to assign exercises out of the method book with ease through Google Classroom and Schoology. Educator 1 stated that Schoology was used frequently for the submission of recorded exercises due to the program having a recording option attached to the assignment link.

Educator 2, a high school director, shared that utilizing Zoom meetings and Schoology worked best for them while teaching online. According to Educator 2, Zoom played a major role in keeping students engaged in the class online as well as promoting participation during online classes. The educator shared, "Without Zoom or something of that format, I don't think we

would have been as successful as we were during that time at all." Educator 2 also stated that Schoology helped a lot because it allowed the educator to put together and present their lessons in a user-friendly format for the students, making it easy for the students to understand the expectations of the lesson.

Educator 3, a high school director, preferred using SmartMusic during online instruction. Educator 3 shared that SmartMusic provided the next best opportunity to play ensemble music and allowed students to continue their ensemble playing while being virtual. When explaining how SmartMusic helped their students during virtual instruction, the educator stated that SmartMusic "gave them (students) a sense of still being able to play with an ensemble but play individually. Although they still can hear the other parts, they could still go through their (individual) parts." The educator further stated that using SmartMusic during the pandemic allowed them to use the program to its full capacity.

Educator 4, a high school director, shared relying heavily on Zoom during virtual instruction. Although students would play along with the SmartMusic tract that Educator 4 had played while muting the students, the educator stated that it was a meeting time that the students would look forward to because of the camaraderie. Educator 4 sometimes invited special guests to the Zoom meetings and had a "question and answer" segment following the sharing portion of the special guest. Educator 4 also added that the Zoom meetings were "just kind of fun and engaging" and a "social aspect, because the kids are stuck at home, they still got to see all their friends."

For Students

Table 8: Favored Technology for Student Use (According to Educators)

Type of Technology	Number of Educators
Essential Elements Interactive	1
Phones/Chromebooks	4
Recording Apps	2
Schoology	4
Schoology for Quizzes	1
SmartMusic	3
Virtual Sticker Chart	1
Zoom	3

Each educator was asked, "Which technology strategies did you find worked best for your students?" Educator 1 stated that their students responded highly to the Virtual Sticker Chart, which was a Google Document, and Essential Elements Interactive. Through EEI, the students had access to online tools to assist them in playing and learning when their teacher was unavailable. Educator 1 also stated that EEI and the Virtual Sticker Chart were tools that actually motivated students to want to complete online assignments. Educator 1 also mentioned using EEI once returning to in-person learning, stating, "I'll pull it up, and I have the kids play for the class with a little backtrack, and they usually like that." In addition to using EEI and the Virtual Sticker Chart, Educator 1 stated that the students preferred to use their phones or Chromebooks to record themselves when submitting playing assignments.

Educator 2 shared that because many online assignments required students to record themselves, students preferred to use their phones. The educator answered:

> … their phones because a lot of the assignments that I had them complete required them to record themselves because, of course, it is Band. I couldn't have 43 people on a Zoom call at the same time. So, their phone or some type of Chromebook recording themselves playing their instrument. I think they enjoyed that a lot because also due to the fact that

> they got to do something on their own. They didn't have to feel nervous; they didn't have to feel ashamed. So the students being able to play their instrument in the comfort of their own home, by themselves, without feeling any type of judgment, I think that benefit[ed] the student; it helped build their individual musicianship.

Three high school directors mentioned SmartMusic as a favorite for student use. Educator 3 shared that students favored using SmartMusic and that SmartMusic "gave them a sense of still being able to play with an ensemble but play individually." He also stated, "They still can hear the other parts; they could still go through their parts, so I would say SmartMusic was the best tool that we got a chance to really dive into and use to its full capacity.

In regard to using Zoom, Educator 4 shared how they used it to keep students engaged during online learning, stating:

> So the kids told me, "The music class, the only one that be on Zoom." So, I was trying to take advantage of that and give them more stuff to where they'd be engaged, such as NBA basketball players, collegiate band directors, as special guests to come on our Zoom. The kids would be like, "Who's coming on today?" So, I think it was just kind of fun and engaging and a social aspect because the kids are stuck at home. You know, so they still got to see all their friends.

When asked about the technology strategies that worked best for their students, Educator 4's first response was, "Zoom was a lifesaver." Although students could use the recording tools provided in the Schoology program, some still preferred to record on their personal devices.

Technology Use in the Classroom After Shutdown

Questions 7 and 8 refer to the continued use of technology once the educators returned to the classroom. When the schools first re-opened, Cedar Hill ISD allowed parents to have their students return in person or continue learning remotely. Having to teach in-person and remotely, the educators in this study continued to use some of the technology-based strategies they developed while teaching remotely and returned to strategies they used before the shutdown, such as whole ensemble playing. The following addresses which technology-based strategies the

educators continued to use after returning to face-to-face instruction and how they incorporated the strategies into their daily classroom routines.

Educator 1 stated that EEI, Google Drive, and Google Forms continued to be used once they returned to face-to-face instruction, adding that they used Google Drive more now than before the pandemic. The educator shared that although the virtual sticker chart was one of their favorite online tools to use while teaching remotely, they did not have much use for it when teaching in person. However, uploading recorded in-class performances to Google Drive for students to analyze became a useful strategy once returning to face-to-face instruction. The Educator explained, "I will upload stuff to the classroom for the kids to see. I'd be like, 'Hey, I recorded us in class. I dropped it into Google Drive for you all to see. You have an assignment; you got to listen to it and do this.' So it's a nice way for them to analyze what we need to do."

The "this" Educator 1 referred to is a Google Form that the educator created for the students to provide their critiques and feedback on the accompanying video. In addition to using these assignments for the group's self-analyzation, the educator left similar assignments for when they were absent from work. The educator stated that the substitute teacher would play the recordings in class, and the students had to analyze the performance and submit the Google Form using their laptop or phone. Educator 1 further stated that they preferred to leave these types of assignments instead of blank worksheets for the students to fill out. In addition to using Google's Education tools, Educator 1 mentioned that using Schoology made setting up lessons and assignments for their online students very easy with its "step-by-step" feature.

The technology-based strategies Educator 2 continued to use once returning to face-to-face instruction were Schoology, teacher-made music websites, and YouTube. The educator shared that Schoology was the "biggest" technology tool that was used once returning to in-

person learning, noting that Schoology was heavily influenced by the school district. In addition to using Schoology to organize class assignments, Educator 1 shared how other technology, such as Tonal Energy, the iPad, and TVs, were used in the classroom, stating:

> The kids still use the tuners, their own personal tuners. I still use the overhead, but I record the kids more, a lot more. I take the Tonal Energy app a step further. We were fortunate enough to get TVs outfitted for three of the classrooms. I connect the iPad I'd be using for Tonal Energy to the TVs so that the kids could also see what I'm seeing if they are in tune or out of tune. So, connecting that to the TV, the students can see for themselves, not just hear me tell them that they're out of tune. And using the Tonal Energy app, they could visually see for themselves. They want that green face to open up. So, that's one thing that I do now that I didn't do pre-pandemic.

Educator 2 also shared that using resources from YouTube and a teacher-made website with in-person students, as well as online, improved the students' sight-reading skills and were great to use when trying to rebuild the students' endurance and playing ability, which declined for many during the time away from in-person ensemble playing.

Educator 3 expressed using SmartMusic more often now than before the pandemic. When asked about the strategies used once returning to face-to-face instruction, the first tool the educator mentioned was SmartMusic. Educator 3 stated that they continued using SmartMusic in the classroom so the students could play along when introducing a piece of music, explaining, "I was using SmartMusic a lot more than I did before." Due to Educator 3's ensemble's playing ability, more time and emphasis was placed on repertoire rather than beginning band theory. However, in reference to their daily classroom procedures following the pandemic, Educator 3 answered, "My daily class routine definitely included more technology. Using the harmony director a lot more, relying on, again, Smart Music a lot more. But the routine kind of stayed the same, but as far as going through fundamentals, rolling on to sight reading, then rolling on to ensemble skills, we're going over to music."

Sight Reading Factory was also mentioned by Educator 3 as a technology tool used in their daily class routine. The educator stated, “Sight Reading Factory was the software that we used, as well as SmartMusic. You could do different things, pull up different pieces, and then and so forth.” In regard to the marching band side of the classroom, the educator explained that through the online application BEAM, students could download music and save the sheet music as a PDF.

The most useful strategy Educator 4 shared was the use of recordings, stating that having the students record themselves playing as they did while learning remotely saved time in class by not having to go down the line to hear each student individually play a specific section of the music. Educator 4 also shared that sightreadingfactory.com and Google Meet continued to be used once returning to in-person instruction, “I still use Sight Reading Factory. I still use Google Meet with my leaders when we have a leadership meeting, usually once a week, to discuss the goals for the week, so I still do that. That doesn’t change.” In addition to sightreadingfactory.com, Google Meet, and recording software, Educator 4 discussed a new technology strategy that became popular after the pandemic, BEAM. BEAM is a digital tool that is used with Ultimate Drill Book (UDB) and allows its users to file and distribute sheet music digitally. Educator 4 stated that since using this program, they are “totally paperless in the band hall.” The educator provided an example of how BEAM is used in their band program, stating:

> So Mr. J. gets through with arranging a song. He’ll go upload it to the folder, and the kids find it. Boom, it’s there! I’m gonna say, “Everybody, pull out ‘Neck;’ we went over that yet?” The kids are gonna be working on their music, right? So once we introduced this, they already have their music. There’s no need to pass it out. The music is in the folder for next year, so the students already know their music before we start rehearsal.

Also, Educator 4 mentioned that the students could pull up their music on their own smart devices, laptops, or computers at home, stating that by using BEAM to organize band music,

"it's always connected," giving students and directors easy access to the music at all times. When asked whether their current daily class routine includes more technology than before the shutdown, all educators agreed that it does.

Summary

The results presented in this chapter demonstrated the diverse use of technology and participants' perspectives regarding their experiences as band directors during and after the COVID-19 pandemic. Educators began their interviews by reflecting on how technology was used in band classes before online instruction began. This information provided a starting point to demonstrate the growth of technology used for band instruction during and after the pandemic. The educators' responses were consistent regarding the type of technology used to continue teaching challenging instrumental music lessons.

After explaining the details of using technology in the classroom during face-to-face teaching, the teachers discussed readiness to teach exclusively with technology, ways they became prepared, technology strategies developed during the pandemic, and the technological strategies that continued to be used even after their programs returned to in-person instruction. In addition to using tuners, electric metronomes, and projector screens, directors continued to use some of the technologies developed for online learning in the classroom. When asked about resources used to prepare for teaching during the pandemic, all educators mentioned connecting with colleagues and experts online.

The interviews concluded with the directors' positive and negative takeaways from the experience of teaching band online. For one educator, it was the realization of remembering that band is just band. Simultaneously, they understood that the social component that band affords its members was more important during online instruction than ever before. For other educators,

the importance of knowing music theory became very evident, as well as their acceptance of incorporating more technology into band instruction in the classroom and on the field, changing the way band was initially taught for years prior to the COVID-19 pandemic. The insights gained from these interviews underscore the resilient adaptation of band directors to the challenges posed by the COVID-19 pandemic.

Chapter Five: Conclusion/Discussion

The COVID-19 shutdown caused a significant disruption to education and impacted instrumental music programs. Band directors faced challenges transitioning to online instruction during the COVID-19 shutdown because they were initially unprepared for the necessary technology. Despite the challenges, band directors in the Cedar Hill Independent School District seized the opportunity to enhance their teaching methods by incorporating technology, music theory, history, and cultural lessons and highlighting individual musicianship. This study examined the practical strategies that band directors developed in response to the shutdown. The study aimed to examine the effectiveness of these strategies and how they were implemented as schools returned to in-person learning. Research efforts led to the development of strategies focusing on technology-based instruction and teacher preparation for online band instruction.

This study used a qualitative research design. The researcher reviewed relevant literature and interviewed band directors from Cedar Hill ISD who taught amid the COVID-19 shutdown. According to Creswell and Creswell, qualitative research uses the natural environment and the researcher as crucial elements.[185] Before beginning the study, approval was obtained from the Liberty University Institutional Review Board, the thesis director and editor, and the Cedar Hill Independent School District. Communication was initiated via telephone and email to explain the objectives and criteria of the study and engage participants. Interview arrangements were then made with the consent of those invited.

The recruitment process included contacting potential participants by telephone and email to clarify the study's objectives and eligibility requirements. Once individuals confirmed their

[185] Creswell and Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (London: SAGE, 2018), 181.

willingness to participate, interview sessions were scheduled at mutually convenient times and locations. Subsequently, the interviews were transcribed from audio recordings for thorough examination and analysis to address the research questions and hypotheses presented effectively.

Following the interviews, the transcribed audio recordings were carefully reviewed to examine and respond to the research questions and hypotheses posed in the study. This detailed analysis aimed to provide valuable insights based on the information collected by Cedar Hill ISD band directors during the challenging COVID-19 closures. Through this comprehensive qualitative approach, the study sought to contribute to the existing body of knowledge about the impact of the pandemic on music education and band activities in educational settings.

Summary of Study

This study aimed to provide other music educators with successful tools they can use in the band room when attempting to utilize technology in their band curriculum. As music educators, band directors understand how important it is to integrate technology into the band curriculum. However, they are sometimes unsure how to effectively use the available teaching technologies. Research suggests that while the benefits of technology are recognized, one may be hesitant to integrate it into their teaching practices because they are unfamiliar with its applications. The results of this study, particularly the insights from experienced band directors, provide valuable guidance for successful instructional technologies that can be implemented in the band classroom. Additionally, this research will provide college and music teachers with valuable information to improve their curriculum and enable them to prepare their students better to teach effectively using technology.

This study was conducted in an urban school district in southwest Dallas, Texas. The researcher worked with each participant individually to review the ten interview questions and

document their responses. The twenty to sixty-minute interviews occurred at the participants' workplace or their residence. Middle and high school band directors were recruited through phone calls or emails, where the researcher outlined the study's purpose and participation requirements. The participants included band directors who taught before, during, and after the closure of Cedar Hill ISD in 2020 due to the pandemic. All band directors held advanced music teacher certification from Texas, with teaching experience spanning five to twenty years.

The interview process included asking ten questions while audio recording and taking notes. Each interview lasted between thirty and fifty minutes. Upon completion, the researcher transcribed the audio recordings and prepared the data for analysis using Microsoft Excel and MAXQDA. Digital copies were made of the audio recordings, and the interview data were transcribed into Excel to create a spreadsheet. This table was later imported into MAXQDA for coding, revealing code categories, themes, and subtopics. The researcher also analyzed coded categories to uncover themes in participants' responses.

The interview questions that addressed RQ1 explored vital technology-related themes before the COVID-19 pandemic, including the types of technology used for instruction, communication, and planning. Before the pandemic, the Cedar Hill ISD band directors utilized the Harmony Director, manual tuners, Google Drive, Google Sheets, and Microsoft Word for instruction. Applications like Band app and online databases such as CHARMS were used for communication.

RQ2 aimed to explore the technological challenges middle and high school band directors encountered in Cedar Hill Independent School District during the COVID-19 pandemic. Two key questions from the survey used to collect data for this research focused on the preparedness of directors to teach band online and the negative aspects they experienced. The responses

revealed that most directors struggled with preparedness, rating themselves low in the ability to teach band effectively online. Technological issues such as varying internet speeds, delays, and sound quality impacted the directors' ability to conduct online band rehearsals successfully during the pandemic. While the directors were motivated to network with other educators to improve their ability to use technology to teach online, the technological challenges they faced with internet speed and sound quality of recordings influenced their ability to monitor and correct students' mistakes, raising concerns about the effectiveness of virtual instruction on student progress.

The interview questions that addressed RQ3 explored technologies used during the COVID-19 pandemic, which technologies the educators favored or had difficulty using, and the technologies that continued to be used once CHISD schools returned to face-to-face instruction. Educators used technologies such as Google Classroom, SmartMusic, Zoom, and others during and after the COVID-19 pandemic. Educators relied on virtual conferencing applications such as Google Meet and Zoom for virtual class meetings and online teaching tools such as MusicTheory.net and Sight Reading Factory for online lessons and recording applications in SmartMusic to assess individual student performance. The researcher found Essential Elements Interactive, Google Classroom, Google Drive, Schoology, and SmartMusic to be the preferred technologies of the directors. While all directors used Google Docs and Google Drive for assignments and assessments, one created tools like virtual sticker charts to keep their students engaged. The directors improved their online instruction and lesson planning and increased student engagement by using a combination of online resources, teaching tools, and platforms like YouTube.

Summary of Findings and Prior Research

This research was conducted with band directors from middle and high schools in Cedar Hill ISD, who had been teaching before, during, and after the COVID-19 pandemic. The participants had between six and sixteen years of relevant professional experience. In the high school band program, the three directors had a student enrollment of over 250 at the beginning of the pandemic. The middle school director also oversaw a band program with nearly 200 students. The study included interviews with four band directors who responded to ten detailed questions. Among them, three directors were alumni of the same historically Black college and university, while one graduated from a diverse university in Texas. All four participants were male and identified as African American.

Analysis of Survey Responses in the Research Study

Survey question number one addressed RQ1 directly. The question addressed the pre-shutdown utilization of technology in classrooms for communication with students/parents and lesson planning. RQ2 was addressed using questions three and ten in the survey. The researcher discovered that before the pandemic, the Cedar Hill ISD band directors used a Harmony Director and manual tuners for instruction, Google Drive, Google Sheets, Microsoft Word for instruction, and Band app and CHARMS when communicating with parents and students. Question three focused on the directors' opinions about being prepared to continue online band classes. Among the four directors in the study, preparation was the primary hurdle in transitioning to online teaching. Based on the responses, three directors unanimously scored themselves a two out of ten on preparedness to teach band online.

Survey questions two, six, seven, and eight investigated the directors' technology choices to uphold the delivery of top-notch online instruction amidst the shutdown. The focus was on

determining the favored technologies among both directors and students, as well as identifying the ongoing technological approaches that were utilized post-pandemic. The findings of this research study revealed that the technologies utilized by directors during the pandemic teaching period, which they continued to employ after, can be categorized into three main groups: instruction, communication, and lesson planning. For instruction, BEAM replaced music distribution, Google for Education Applications became a standard in lesson presentation, and the Harmony Director was still used to warm up the band, tune, and act as a metronome. Additionally, the overhead projector was employed to project learning objectives, announcements, music, the Tonal Energy tuning application, and videos during in-person teaching sessions. Online sites that continued to be used upon returning to in-person learning included MusicTheory.net, sightreadingfactory.com, SmartMusic, and YouTube. Furthermore, students were permitted to use personal devices during class to access BEAM and tuning applications.

To communicate with parents and students, the directors continued to use the social applications Band app, CHARMS, Schoology, and Email through Google. Virtual meetings through Zoom or Google Meet were added to in-person meetings with parents to facilitate communication with those who were choosing not to participate in face-to-face meetings. When planning lessons and rehearsals, the directors used BEAM, Google Sheets, Microsoft Word, Schoology, and YouTube.

Survey questions four and five addressed how the directors' undergraduate studies prepared them to teach with technology and what they did to prepare or improve online teaching during the pandemic. During undergraduate studies, the focus on technology in school was minimal, with SmartMusic being the primary tool. Other technologies discussed included

Harmony Director, ear training websites, and notation software such as Encore, Sibelius, and Finale. Emphasis was placed on ear training and basic knowledge, but technology was not integrated into lessons overall. To improve online instruction during the pandemic, the directors utilized Essential Elements, participated in online workshops, and attended virtual conferences such as the Texas Band Association Conference (TBA) and ConnSelmer. They also joined teacher groups to observe peers' methods, watched educational videos on platforms such as YouTube, collaborated with colleagues during the pandemic, and sought advice from peers to explore innovative teaching tools and techniques for their online lessons.

Survey question nine explored the positive takeaways from the experience of teaching online during the pandemic. Reflections on teaching during the pandemic led the directors to rethink the core principles of teaching band and music, encouraging creativity and being pushed out of their comfort zones to accommodate different learning styles. The experience highlighted the importance of flexibility, adaptability, social-emotional learning, and integrating technology into classroom practice.

Analysis of Literature Review

The literature review addressed the first-hand experiences of music teachers navigating teaching and teaching with technology amid the disruptions caused by the COVID-19 shutdown. Additionally, the literature highlighted the importance of integrating technology into music education and outlined the expected standards for using technology in music education. Although technology was already being integrated into music classrooms before the global health crisis, the sudden transition from traditional face-to-face instruction to virtual platforms exposed the stark reality of the underuse of technology in instrumental music education. The literature review also addressed Prensky's digital natives and digital immigrants, technology in

the classroom, Housewright Declaration and Vision 2020, COVID-19 shutdown experiences, and technology practices used in response to the shutdown.

Prensky's framework on digital natives and immigrants highlighted the need for educators to adapt their teaching approach to how students process information. The articles highlighted the importance of digital literacy for teachers to use technology effectively in the classroom. To successfully use technology effectively, it is necessary to understand the cognitive differences between digital natives and immigrants and to adapt teaching methods to the evolving educational landscape. Educators must address these cognitive differences to improve students' digital learning experiences and increase their digital fluency. Digital fluency is essential for educators to engage with technology effectively in education. Wang emphasizes the importance of digital fluency, highlighting that educators must adapt to technology to enhance instruction and learning for digital natives.

In the literature on technology integration in education, several key themes emerged. These themes encompassed the benefits and challenges of incorporating technology into classroom practice and underscored the various ways educators have leveraged technology to enrich student learning. Key topics included barriers to successful technology integration, such as limited access and professional development, the utilization of platforms like YouTube to deliver valuable educational content, the implementation of Bring Your Own Device (BYOD) policies to facilitate flexible learning opportunities, and the use of digital curricula and tools such as SmartMusic for assessing student performance and enhancing music education. These themes highlighted the significant influence of technology on modern educational practices and the need for educators to address both the opportunities and obstacles that technological advances bring to the classroom.

Music educators used various technologies to improve their teaching methods during the COVID-19 lockdown. Specific examples of the use of technology include virtual ensembles, video conferencing, and the use of online resources. Cayari created virtual ensembles with high school students, allowing them to collaborate and create music digitally through edited recordings. Instrumental music educators used platforms such as Zoom, Skype, and Google Hangouts for synchronous online lessons, enabling international collaboration and improving sound quality through additional technologies such as microphones and signal processors. Many educators used platforms such as YouTube, Soundtrap and SmartMusic to enhance music lessons and provide opportunities for student engagement and creativity in a virtual environment. These examples illustrate the innovative ways music educators adapted their teaching practices by integrating technology during the pandemic.

In addition to how music educators used technology amid teaching during the shutdown, the literature review discussed experiences the music educators faced during this change. A study by Hash examined how band directors adapted to distance learning with challenges such as limited student participation stemming from factors including internet access or home responsibilities.[186] Long, a college band director, shared the difficulties adapting since performing ensembles could not come together.[187] MacLaine reflected on the abrupt change caused by the pandemic, which led to a shift in teaching approaches.[188] Overall, the educators in the study faced unprecedented challenges during the pandemic that required significant adjustments to traditional teaching methods.

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[186] Hash, "Remote Learning."

[187] Long, "The Instrument-Less Band Director."

[188] MacLaine, "Waiting for the Laughter."

Lastly, articles discussing the Housewright Declaration and Vision 2020 outlined the importance of music educators embracing technological advances, a topic highlighted even more during the COVID-19 lockdown. The Housewright Declaration, a vital outcome of the Housewright Symposium held in 1999, emphasized the need for music educators to embrace technological advances and recognize their central role in advancing the study of music. McCarthy's post-2000 analysis underscored the transformative impact of technology on music education and emphasized the need for educators to adapt to it.[189] Lehman's perspective on music education from 2020 to 2050 emphasizes the continued importance of teachers given the technological advances shaping the music learning experience and urges a balance in the use of useful technology while preserving the essential role of educators in education.[190] These articles illuminate the critical role of technology in shaping the future of music education and the importance of educators adapting to these advancements.

Limitations

While this study provides valuable insights into the experiences and perspectives of music educators regarding technology integration during the COVID-19 pandemic, it is important to acknowledge certain limitations. These limitations include the number of participants, the central study location, and the currently available literature. Despite the range of experiences of the four music educators interviewed for this study, many respondents may have provided additional connections and perspectives. Including a larger sample of participants from additional school districts might have revealed patterns specific to unique environments and cultures. The literature review identified a scarcity of studies on technology integration in music

[189] McCarthy, "The Housewright Declaration."

[190] Lehman, "A Look Ahead."

education during the COVID-19 pandemic. However, this laid the foundation for the significance of this study.

Recommendations for Future Study

As technology integration in music education progresses, an increasing demand arises for additional research to explore its implications and potential advantages. Building on the findings of this study, there are numerous ways future research can enhance understanding of how technology is used in teaching band methods and its impact on student learning. First, this study should be repeated on a larger scale. Increasing the number of participants and overall scope of research would allow for a broader view of how band directors are integrating technology into teaching band methods. The research could collect data from different regions of the country, grade levels and demographics. Additionally, future research could explore technology integration on other grade levels, such as elementary music, or other instrumental fields, such as chorus or orchestra.

Although this study focused on how band directors used technology to teach band amid the COVID-19 pandemic, additional studies should explore the effectiveness of technology tools, pedagogical approaches, and teacher training and professional development. By exploring the effectiveness of specific technology tools such as digital sheet music, online applications and websites, and recording software, educators can gain resources to improve student learning and engagement in band programs. Studying various pedagogical approaches integrating technology into band instruction, such as examples of flipped classrooms, collaborative learning, and project-based learning, can shed light on their impact on student outcomes. Lastly, examining the effects of teacher training and professional development programs that include technology

integration can reveal how they impact band directors' ability to integrate technology into band instruction effectively.

Implications for Practice

This study provides valuable recommendations to help band directors in their efforts to combine technology with traditional band methods. According to the research, the following should be incorporated: the band classroom, the curriculum for undergraduate teacher preparation, and professional development for music educators.

The Band Classroom

Music educators should recognize the importance of incorporating technology into their teaching methods. The current generation of secondary education students has grown up with technology exposure, which has significantly impacted how their brains are wired. Therefore, educators must develop materials incorporating technology to engage these students effectively.[191] While technology has not always been a part of band pedagogy, educators must utilize it to teach this generation of learners the same fundamental concepts of making instrumental music. Recent research has shown that students in the CHISD band program continued to make musical progress despite the pandemic's challenges. This is possible through innovative tools developed by their band directors, including online websites, SmartMusic, BEAM, and their phones or Chromebooks. By leveraging these tools, music educators can create a more immersive and interactive learning experience for their students, leading to better engagement, retention, and progress. It is essential to recognize that the role of technology in

[191] Alejandro J. Ganimian, Emiliana Vegas, and Frederick M. Hess, *Realizing The Promise: How Can Education Technology Improve Learning For All?* (Brookings Institute, 2020), 48, https://www.brookings.edu/wp-content/uploads/2020/08/edtech_playbook_full_v2.pdf

music education will only continue to grow in the coming years, and educators must embrace this change to provide their students with the best learning experience possible.

Moreover, band directors can improve their pedagogy by integrating technology in various aspects of class instruction. In addition to using technologies such as the Harmony Director and tuning applications on the students' phones, BEAM software can replace sheet music distribution for concert and marching bands. Instead of placing sheet music on stands, students can utilize their phones or tablets with digital versions of their music. This ensures continuous access to their music. Directors can develop a Google Form to replace tickets out the door, eliminating the need for paper submissions as students can conveniently submit their information online. By creating online polls, such as a Google Form, directors can format data instantly and use it to plan future content or activities. If a particular section of the band is having trouble with a particular technique, the director can look up a YouTube video to demonstrate how to produce that technique on their instrument. For sightreading, the teacher can ask the students to pull up a particular song in SmartMusic, and they can sightread it on the spot.

In conclusion, incorporating technology in the classroom can be a game-changer for band directors. By using technology, they can make the learning process more efficient, engaging, and effective. The possibilities are endless, and teachers can use technology in various ways to create a fun and engaging learning experience for their students.

College Music Education Courses

Colleges and universities should emphasize courses that will equip aspiring music educators with the skills to integrate technology into their teaching practices. With the rapid advancements in technology, it has become increasingly cruicial for aspiring music educators to be well-versed in the latest technological tools and methods. By providing comprehensive

technology-focused instruction, collegiate music education programs can ensure that their students are adequately prepared to meet the current education standards and are better equipped to engage and inspire students in their classrooms. Educators must prioritize technology-focused instruction in an age where technology plays a significant role in almost every aspect of life.

Undergraduate classes that incorporate technology into band teaching methods can be quite comprehensive. These classes can focus on developing lessons using various technology-based platforms like Nearpod, Kahoot, and Quizziz. Teachers can use such platforms to make the learning experience more engaging and interactive for their band students. In addition, such classes can also explore how technology can be used to assess learning in band. For instance, teachers can use apps and software to track individual student progress, provide feedback, and even conduct assessments.

Moreover, these classes can also help teachers understand how to transform traditional, worksheet-based lessons into digital formats. This can be particularly useful for teachers new to using technology in the classroom. By learning how to use technology effectively, teachers can create a more inclusive and diverse learning environment for their students. Overall, undergraduate classes that address the use of technology in band teaching methods can help teachers upskill and stay relevant in the rapidly evolving world of education.

Professional Development

With technology rapidly advancing, educators should keep up with these changes to provide their students with the best possible education.[192] Therefore, school principals and fine arts directors should provide opportunities for their teachers to take technology-focused

[192] Abid Haleem et al., "Understanding the Role of Digital Technologies in Education: A review," *Sustainable Operations and Computers* 3, no. 10 (2022): 277.

professional development and perhaps make it mandatory for them to attend. Technology-based professional development in music will allow teachers to increase their digital fluency and keep up with the latest technological advancements. Participating in technology-based professional development, in turn, will enable them to update their instructional strategies and integrate new technologies into their teaching practices. By making technology-focused professional development a requirement, educators will be better equipped to engage their students in the learning process using digital tools, resulting in improved learning outcomes.[193] Additionally, this will ensure that students are prepared to use digital tools in an educational setting.

Summary

This study offers educators a valuable resource to enhance their understanding of utilizing technology in the band classroom, general education, or other music classrooms. Moreover, it emphasizes the significance of embracing and effectively integrating technology into teaching practices to enhance student engagement and achieve desired outcomes for student success. The interview participants acknowledged that they were not adequately prepared to use technology. However, they expressed confidence in overcoming this challenge by relying on online networking, virtual conferences, and self-initiated exploration of online resources. Their persistent efforts to find tools that worked for them and their students proved successful through continuous trial and error. They continued to use what worked best for their students, and their engagement and motivation inspired them to push forward with more technology integration in the classroom and on the field.

[193] Stella Timotheou, "Impacts of Digital Technologies on Education and Factors Influencing Schools' Digital Capacity and Transformation: A Literature Review," *Education and Information Technologies* 28 (2022): 6711, https://doi.org/10.1007/s10639-022-11431-8.

Research indicates that integrating technology into teaching is essential. Today's learners learn differently, and when the same pedagogy needs to be taught, it should be taught differently to engage the digital native learner. Altering the teaching methodology of instrumental music may not be imperative, but adjusting how music educators choose to deliver their material is important. The traditional method of teaching band can be enhanced through the integration of technology. Lastly, in addition to improving content with the use of technology and seeking technology-focused professional development opportunities, music teacher programs at the collegiate level should prepare future music educators to teach their content with technology rather than just using it to prepare presentations and documents. Perhaps the lessons learned by the participants in this study were also learned by college professors while teaching online due to the COVID-19 pandemic.

Appendices

Appendix A: IRB Approval Letter

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 21, 2023

Ancheyl Green
Jerry Newman

Re: IRB Exemption - IRB-FY22-23-1257 Change for the Better? An Examination of How Technology-Based Instruction During COVID-19 Changed Teaching Methods in Band

Dear Ancheyl Green, Jerry Newman,

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.(ii). 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).
Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation.

Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.

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 irb@liberty.edu.

Sincerely,

[redacted]
Administrative Chair
Research Ethics Office

Appendix B: Doctoral Thesis Proposal Decision

Doctoral Thesis Proposal Decision

The Thesis Advisor and Reader have rendered the following decision

concerning the proposal status for

An'Cheyl Davis (Green)

on the research topic title of

Change for the Better? An Examination of How Technology-Based Instruction During COVID-19 Changed Teaching Methods in Band

as submitted on January 22, 2023

_____ **Full Approval to proceed with no proposal revisions.**
The student may fully engage the research and writing process according to the established the timeline. Upon full approval, the student may apply for IRB approval, if applicable (see STEP 4 concerning IRB approval process).

_____ **Provisional Approval to proceed with proposal pending cited revisions.**
This is the most common decision. The student must resubmit the proposal with cited revisions according to the established timeline. The Advisor will indicate the committee's status on your response to the required revisions. The student may NOT apply for IRB approval until full approval is granted.

_____ **Redirection of Proposal**
The student is being redirected to develop a new proposal, as minor revisions will not meet the expectations for the research project. The student may NOT apply for IRB approval.

_____

Print Name of Advisor **Signature** **Date**

_____

Print Name of Reader **Signature** **Date**

Appendix C: Cedar Hill ISD IRB Approval

Cedar Hill Independent School District
285 Uptown Blvd. | Cedar Hill, TX 75104 | 972-291-1581 | chisd.net

June 28, 2023

To An'Cheyl Davis:

The Cedar Hill Independent School District Research Review Board has reviewed and approved your request to conduct research in Cedar Hill ISD. It is the District's understanding that this study is being conducted in partial fulfillment of the requirements for a doctorate degree from Liberty University. As such, the study must be implemented based on guidelines and procedures set forth by the University and must adhere to acceptable research practices.

Cedar Hill ISD approves An'Cheyl Davis to conduct her research and at the conclusion of the study, the Cedar Hill ISD requests a copy of the results and any reports that are prepared. These should be forwarded to [redacted] at Cedar Hill ISD. Cedar Hill ISD will request periodic status checks during the research.

If there are any questions, please do not hesitate to contact me by email at [redacted] or you may reach me via phone [redacted] extension [redacted]

Respectfully,

[redacted]

Appendix D: Research Questions

Change for the Better? An Examination of How Technology-Based Instruction During COVID-19 Changed Teaching Methods in Band

Research Questions

1. Prior to the shutdown, how were you using technology in your class (daily class routine) to communicate with your students/parents and to plan your lessons?

2. During the shutdown, what type of instructional technology did you utilize in an effort to continue teaching while virtual?

3. On a scale of 1 to 10, how prepared were you to teach online?

4. What technology strategies were you introduced to during undergrad? Graduate school?

5. In what ways did you become more familiar with technology or increase your knowledge?

6. Which technology strategies did you find worked best for you? Your students?

7. Which strategies did you continue to use in the classroom once you returned to face-to-face instruction?

8. What does your daily class routine look like now? Does it include more technology than before the shutdown?

9. What are your positive takeaways from this experience? (teaching during the pandemic)

10. What are your negative takeaways from this experience? (teaching during the pandemic)

Appendix E: The Housewright Declaration

NOTE: This document is a summation of the agreements made at the Housewright Symposium on the Future of Music Education, held in Tallahassee, Florida, September 23-26, 1999.

Whenever and wherever humans have existed, music has existed also. Since music occurs only when people choose to create and share it, and since they always have done so and no doubt always will, music clearly must have important value for people.

Music makes a difference in people's lives. It exalts the human spirit; it enhances the quality of life. Indeed, meaningful music activity should be experienced throughout one's life toward the goal of continuing involvement.

Music is a basic way of knowing and doing because of its own nature and because of the relationship of that nature to the human condition, including mind, body, and feeling. It is worth studying because it represents a basic mode of thought and action, and because in itself, it is one of the primary ways human beings create and share meanings. It must be studied fully to access this richness.

Societal and technological changes will have an enormous impact for the future of music education. Changing demographics and increased technological advancements are inexorable and will have profound influences on the ways that music is experienced for both students and teachers.

Music educators must build on the strengths of current practice to take responsibility for charting the future of music education to insure that the best of the Western art tradition and other musical traditions are transmitted to future generations.

We agree on the following:

1. All persons, regardless of age, cultural heritage, ability, venue, or financial circumstance deserve to participate fully in the best music experiences possible.

2. The integrity of music study must be preserved. Music educators must lead the development of meaningful music instruction and experience.

3. Time must be allotted for formal music study at all levels of instruction such that a comprehensive, sequential and standards based program of music instruction is made available.

4. All music has a place in the curriculum. Not only does the Western art tradition need to be preserved and disseminated, music educators also need to be aware of other music that people experience and be able to integrate it into classroom music instruction.

5. Music educators need to be proficient and knowledgeable concerning technological changes and advancements and be prepared to use all appropriate tools in advancing music study while recognizing the importance of people coming together to make and share music.

6. Music educators should involve the music industry, other agencies, individuals, and music institutions in improving the quality and quantity of music instruction. This should start within each local community by defining the appropriate role of these resources in teaching and learning.

7. The currently defined role of the music educator will expand as settings for music instruction proliferate. Professional music educators must provide a leadership role in coordinating music activities beyond the school setting to insure formal and informal curricular integration.

8. Recruiting prospective music teachers is a responsibility of many, including music educators. Potential teachers need to be drawn from diverse backgrounds, identified early, led to develop both teaching and musical abilities, and sustained through ongoing professional development. Also, alternative licensing should be explored in order to expand the number and variety of teachers available to those seeking music instruction.

9. Continuing research addressing all aspects of music activity needs to be supported including intellectual, emotional, and physical responses to music. Ancillary social results of music study also need exploration as well as specific studies to increase meaningful music listening.

10. Music making is an essential way in which learners come to know and understand music and music traditions. Music making should be broadly interpreted to be performing, composing, improvising, listening, and interpreting music notation.

11. Music educators must join with others in providing opportunities for meaningful music instruction for all people beginning at the earliest possible age and continuing throughout life.

12. Music educators must identify the barriers that impede the full actualization of any of the above and work to overcome them.

https://nafme.org/resource/the-housewright-declaration/

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