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The Status of Technology Integration in Music Classrooms and Implications for Technology Training: A Survey of K-12 Music Educators in Four Southeastern States

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ABSTRACT

This study investigated the status of technology integration in K-12 music classrooms after the onset of Covid-19 across Alabama, Arkansas, Louisiana, and Mississippi. Participants completed an online survey concerning their technology use, comfort levels with technology, training since the onset of Covid-19, and barriers to technology integration. Previous studies in this area showed a slow increase in technology use. Other studies revealed a need for further training of pre-service and in-service educators to integrate technology into their instruction successfully.

Results of this survey revealed an increase in technology use and comfort levels with technology specific to distance learning such as recording equipment, video conferencing software, online platforms, interactive websites, and apps for tablet devices after the onset of Covid-19. Respondents most often received training from their school district or through their own independent research. Implications for this study indicate (a) teacher training effectiveness is key for those who need more technological comfort in their teaching, and (b) results of surveys such as this contribute to the continued conversation about the importance of technology training for pre-service and in-service music educators.

INTRODUCTION

Recent events concerning Covid-19 shed light on the importance of educational technology. As schools closed in 2020, teachers worldwide adapted to teaching remotely, becoming more tech-savvy. However, their skills sets going into virtual learning revealed that many educators relied mainly on paper-based methods (Norris & Soloway, 2020) rather than exploring ways technology could enhance teaching. Covid-19 also revealed a need for technology workshops, professional development, and undergraduate and graduate courses focusing on technology use and integration. Though many current teachers are generally comfortable using technology, they may be hesitant to use technology in their classrooms (Aydin et al., 2016; Russell et al., 2003; Teo, 2011). Other researchers have investigated the role, effectiveness, integration levels, budgetary spending, and teacher training of education technology (Waddell & Williamon, 2019). The few studies conducted since Covid-19 specific to music education found a unique set of challenges, especially in rural and higher poverty schools (Hash, 2021).

Classroom teachers, being on the front lines, are increasingly “expected to use technology tools in many cases” in the technology integration effort (Teo, 2011, p. 2432). Several studies investigated levels of technology integration in classrooms in subjects such as math and science before Covid-19 (Aydin et al., 2016; Dammers, 2012; Dorfman, 2008; Portowitz et al., 2014; Reese & Rimington, 2000; Sehmann & Hayes, 1996; Teo, 2011; West & Graham, 2005). In addition, studies conducted since Covid-19 showed how the pandemic changed technology use in education such as needed for virtual learning (An et al., 2021; Hash, 2021; Spoel et al., 2020;

& Rahmadi, 2020). The move to virtual learning revealed a need for more research in technology needs and training throughout the country.

Researchers prior to Covid-19 investigated technology integration in music classrooms across several states over the past few decades revealing that technology is not regularly used for specific music-learning purposes (Dorfman, 2008; Reese & Rimington, 2000; Sehmann & Hayes 1996). Sehmann and Hayes (1996) stated that while schools in the Kentucky received funding for technology, school and teacher access to technology varied across the state. They found 43% percent of the music teachers reported not having music software available for their computers, 67% reported not using technology during instruction, and that, while most had a computer, their training was not specific to music education.

Reese and Rimington (2000) found a small percentage of Illinois music educators use a computer during instruction, and most use computers predominantly for communication and administration. About 20% of educators indicated they asked students to use computers in their classrooms, and 28% asked students to use their computers with music software at home (Reese & Rimington, 2000). Dorfman (2008) found that most Ohio music educators used various forms of music technology less than once a month and asked their students to use some form of music technology to complete specific tasks less than once a month. While respondents were comfortable using technology, most, again, used it for planning and administrative purposes.

The onset of the Covid-19 pandemic caused many school closures leading to alternative educational practices, specifically in virtual learning. Schools found students adapted more quickly to technology and online learning than many educators (Spoel et al., 2020). Studies from

Indonesia, Turkey, and the Netherlands revealed that teachers who had prior technological skills and knowledge were more likely to adapt quickly to virtual classes and e-learning (An et al., 2021). Low participation among students, poor or no internet access in rural areas, and low access to devices for teachers and students contributed to virtual learning difficulties (An et al., 2021). While funding through local companies and federal grants provided internet and devices to facilitate virtual education, educators needed training to increase confidence and comfort with implementing technology for distance learning. Pre-service educators completed internships using virtual education models (Thomas et al., 2021). The sudden move to virtual learning after Covid-19 has revealed a need for more research as to technology needs and training in states around the country. Therefore, the purpose of this descriptive study was to investigate the status of technology integration in K-12 music classrooms across Alabama, Arkansas, Louisiana, and Mississippi after the onset of Covid-19.

METHODOLOGY

Participants for this study included music teachers who are members of the National Association for Music Education (NAfME) and who teach music at public and private K-12 schools in Alabama, Arkansas, Louisiana, and Mississippi ($n = 58$). The NAfME Research Assistance Program sent two rounds of emails (first round, $n = 1,062$; second round, $n = 1,060$) that invited them to complete the Technology Usage and Integration Survey, or TUIS (see Appendix A), resulting in 51 participants. The second round of potential participants received an email with the link to the information letter survey through the leadership of their state's music

educators' association resulting in 7 more participants. The National Association of Education Statistics and the National Report Card consistently listed the four states for this study in the bottom ten concerning education test data. They tended to be the bottom four or five of states of the southeast since the early 2000s, and tests scores in 2019 were significantly lower than the national average. Surrounding southern states tended to test at or above average in almost all tested subject areas (The Nation's Report Card, n.d.).

The Technology Usage and Integration Survey (TUIS), designed specifically for this study, is a cross-sectional survey that consists of demographic questions and questions on the participants' use and comfort level with technology usage and integration (see Appendix A). Participants indicated what forms of training they received and how often they independently explored new software or applications to support their teaching since the onset of Covid-19 in February/March of 2020. Participants indicated how often they used specific technologies before Covid-19 and after the onset of Covid-19, their comfort level using various forms of technology, and their level of agreement (on a five-point Likert scale) with ten statements concerning possible barriers to technology integration. Data were analyzed using descriptive statistics, crosstabulations, and Spearman Rho. Specifically, I recoded data into larger groups based on teaching experience, and again based on their technological comfort levels and used crosstabulations and Spearman Rho for analysis. Finally, I used Cronbach's alpha for reliability.

RESULTS

Respondents resided in Alabama ($n = 23$, 39.7%), Arkansas ($n = 9$, 15.5%), Louisiana ($n = 7$, 12.1%), and Mississippi ($n = 18$, 31%), with one respondent not indicating their state. The mean years of experience was 17.2 ($SD = 8.9$) with the majority of respondents having earned at least their master's degree ($n = 27$, 46.6%) or bachelor's degree ($n = 20$, 34.5%). The participants' reported their technology training was either through independent research and training ($n = 43$, 74.1%) or school district-provided training ($n = 41$, 70.7%). Most respondents conducted independent research of new technologies or applications at least a few times per month ($n = 22$, 37.9%). Results as to the frequency of use on the Likert 5-point scale revealed an increase in the use of recording equipment ($n = 24$, 44.5%). While 33.3 % reported a one-point increase in their use of recording equipment after the onset of Covid-19, 42.6% reported no change in their usage (see Table 1). Over half of the participants reported an increase in their use of online platforms or interactive platforms such as Quaver, MusicPlay, Interactive Instruments, Google Classroom, My Choral Coach, and Smart Music, with respondents in each state showing an increase in use ($n = 30$, 55.6%) (see Table 2).

Table 1

Percentage of Change in Use of Recording Equipment (Microphones, Mixers, Video Cameras, etc.) Before and After the Onset of Covid-19 by State

Points of Change	State				Total
	Alabama	Arkansas	Louisiana	Mississippi	
4 point decrease in use	0.0	0.0	0.0	1.9	1.9
1 point decrease in use	3.7	0.0	0.0	7.4	11.1
No change in use	18.5	9.3	5.6	9.3	42.6
1 point increase in use	13.0	5.6	5.6	9.3	33.3
2 point increase in use	1.9	1.9	1.9	3.7	9.3
3 point increase in use	1.9	0.0	0.0	0.0	1.9

Note. Percentages are of the total number of respondents, $n = 58$.

Table 2

Percentage of Change in Use of Online Platforms/Interactive Websites Before and After the Onset of Covid-19 by State

Points of Change	State				Total
	Alabama	Arkansas	Louisiana	Mississippi	
4 point decrease in use	0.0	0.0	1.9	0.0	1.9
2 point decrease in use	1.9	0.0	0.0	0.0	1.9
1 point decrease in use	1.9	0.0	0.0	1.9	3.7
No change in use	16.7	3.7	1.9	14.8	37
1 point increase in use	5.6	3.7	1.9	5.6	16.7
2 point increase in use	7.4	5.6	5.6	1.9	20.4
3 point increase in use	3.7	3.7	1.9	1.9	11.1
4 point increase in use	1.9	0.0	0.0	5.6	7.4

Note. Percentages are of the total number of respondents, $n = 58$.

All but seven respondents reported an increase in the use of video conferencing software, with 31.5% reporting a three-point increase in use (see Table 3). Participants in each state showed an increase in the use of music education apps for tablet-like devices (see Table 4).

Table 3

Percentage of Change in Use of Video Conferencing Software Before and After the Onset of Covid-19 by State

Points of Change	State				
	Alabama	Arkansas	Louisiana	Mississippi	Total
No change in use	1.9	3.7	0.0	7.4	13.0
1 point increase in use	7.4	0.0	1.9	5.6	14.8
2 point increase in use	13.0	3.7	3.7	7.4	27.8
3 point increase in use	13.0	5.6	5.6	7.4	31.5
4 point increase in use	3.7	3.7	1.9	3.7	13.0

Note. Percentages are of the total number of respondents, $n = 58$.

Table 4

Percentage of Change in Use of Music Education Apps Before and After the Onset of Covid-19 by State

Points of Change	State				
	Alabama	Arkansas	Louisiana	Mississippi	Total
4 point decrease in use	1.9	0.0	0.0	0.0	1.9
2 point decrease in use	0.0	0.0	0.0	1.9	1.9
1 point decrease in use	0.0	0.0	0.0	1.9	1.9
No change in use	13.0	5.6	5.6	11.1	35.2
1 point increase in use	5.6	9.3	0.0	11.1	25.9
2 point increase in use	13.0	0.0	3.7	3.7	20.4
3 point increase in use	3.7	0.0	3.7	1.9	9.3
4 point increase in use	1.9	1.9	0.0	0.0	3.7

Note. Percentages are of the total number of respondents, $n = 58$.

Nine (15.5%) respondents reported no change in their comfort level using video conferencing software. The remaining respondents reported at least a one-point increase in comfort level; a one-point increase was reported by 29.3% of respondents, a two-point increase by 24.1%, a three-point increase by 17.2%, and a four-point increase by 5.2%. There was also an

increase in the comfort level using a course Learning Management Systems (LMS); a one-point increase was indicated by 32.8% of respondents, a two-point increase by 22.4%, a three-point increase by 5.2%, and a four-point increase by 1.7%. There were no significant correlations found between any changes in comfort levels and the participants' years of experience or degree level. The respondents who received training from their school district had an increase of one to four points in their comfort level using software for online video conferencing during their instruction ($n = 35$, 66%) and using an LMS ($n = 27$, 51%). Those who indicated they had conducted independent research and training also reported an increase of anywhere from one to four points in their comfort level using software for online video conferencing during their instruction ($n = 36$, 68%) and using an LMS ($n = 27$, 51%).

There was a significant positive correlation found between those indicating they had received technology training through workshops offered by colleges and universities ($n = 10$, 18.9%) and a change in their comfort level using technology to teach classes such as class piano, class guitar, and other instrument-specific classes ($r(51) = .377$, $p = .005$). A significant negative correlation was found between technology training by attending presentations at professional conferences and a change in the comfort level using technology to transcribe notation for instruction ($r(51) = -.321$, $p = .019$). A significant negative correlation was also found between technology training through workshops conducted by professional organizations and a change in their comfort level using technology to transcribe notation for instruction ($r(51) = -.282$, $p = .041$).

Responses on types of training attended included webinars offered by Tech Company, and workshops by Essential Elements, the Amro Music company, music educators association elementary divisions, neighboring school districts, Dr. Carol Krueger, and CEU (Continuing Education Unit) technology through different universities. There was a significant negative correlation found between those who received technology training from other unspecified sources ($n = 6, 11.3\%$) and a change in their comfort level using class or program administration software ($r(51) = -.277, p = .044$). A significant negative correlation was also found between those who indicated technology workshops from other sources and a change in their comfort level using technology to give one-to-one instruction such as individual voice or instrument lessons ($r(51) = -.287, p = .037$).

Respondents reported exploring new technologies a few times per month to daily since the onset of Covid-19 ($n = 33, 56.8\%$). There was a positive significant correlation between how often they explore new software/apps and a change in their comfort level using technology to teach/support music theory content ($r(51) = .303, p = .028$) and with using technology to teach classes such as piano, guitar, and other instrument instruction classes ($r(51) = .335, p = .014$). A positive significant correlation was found between how often respondents explore new software/apps and a change in their comfort level using technology to teach/support music history content ($r(51) = .291, p = .034$). Those that indicated they explore new technology, apps, or software either once a week, a few times a week, or daily ($n = 10, 18.8\%$) indicated a zero to two-point change in their comfort level using technology for those three tasks above.

There was high level of agreement with statement one ($n = 47$, 81.1%), “I consider the integration of technology as an important component to music education.” However, there was a high level of disagreement ($n = 39$, 72.5%) with statement two concerning technology training during undergraduate studies: “My undergraduate program prepared me to implement integration in my classroom.” The respondents were split on the same question (statement three) concerning their graduate program (see Table 5).

Table 5

Frequency and Percentage of Level of Agreement for Statements Two and Three

Level of Agreement	Statement Two		Statement Three	
	<i>n</i>	%	<i>n</i>	%
Strongly Disagree	27	46.6	14	24.1
Disagree	15	25.9	6	10.3
Neither Agree nor Disagree	8	13.8	13	27.6
Agree	3	5.2	13	22.4
Strongly Agree	0	0.0	4	6.9

Note. Statement Two: “My undergraduate program prepared me to implement technology integration in my classroom.” Statement Three: “My graduate program prepared me to implement technology integration in my classroom”

Statement seven, “My school district considers it important to provide me with adequate funding to purchase subscriptions to online music education platforms,” had a relatively even distribution between agreement and disagreement (see Table 6). Statement ten, “My school district considers it important to provide me with funds to seek out outside district training specific to music technology,” had a slight majority of respondents that either disagreed or strongly disagreed with the statement (see Table 6).

Table 6*Frequency and Percentage of Level of Agreement for Statements Seven and Ten*

Level of Agreement	Statement Seven		Statement Ten	
	<i>n</i>	%	<i>n</i>	%
Strongly Disagree	11	19.0	11	19.0
Disagree	9	15.5	12	20.7
Neither Agree nor Disagree	14	24.1	15	25.9
Agree	10	17.2	9	15.5
Strongly Agree	9	15.5	6	10.3

Note. Statement Seven: “My school district considers it important to provide me with adequate funding to purchase subscriptions to online music education platforms,” Statement Ten: “My school district considers it important to provide me with funds to seek out outside district training specific to music technology”

A positive correlation ($r(51) = .368, p = .007$) was found between the school locale and statement one concerning the importance of technology in music education. All the respondents who reported their school locale as ‘Town’ ($n = 17, 32.1\%$) agreed or strongly agreed with statement one. Respondents who reported their school locale classification as ‘City,’ ‘Suburban,’ or ‘Rural’ either disagreed with statement one or selected neither agree nor disagree ($n = 6, 11.4\%$). A positive correlation was found between the school locale and statement two concerning technology training in undergraduate programs ($r(51) = .296, p = .032$). The respondents who reported ‘City’ ($n = 8, 15.1\%$) as their school locale classification either disagreed or strongly disagreed with statement two.

Spearman Rho analysis found a positive correlation between those who indicated they teach general music and statement seven regarding funding ($r(51) = .276, p = .046$), with 37.8% indicating they either disagreed or strongly disagreed with the statement. The analysis also found a significant positive correlation between statement nine concerning in-service technology

training provided by the school district and those that indicated they teach general music ($r(51) = .277, p = .045$), with 62.2% indicating they either agreed or strongly agreed with the statement. No statistically significant correlations were found between those that indicated they teach general music and any of the other eight statements.

A positive correlation was found between those that indicated they teach choir/show choir and statement ten ($r(51) = .424, p = .002$). Of the 22 respondents (41.5%) who indicated they taught some form of choir ($n = 22, 41.5\%$), a majority either agreed or strongly agreed with statement ten concerning funds provided by the school district to seek outside district music technology training. There was a significant negative correlation found between those that indicated they teach some form of band ($n = 13, 24.5\%$) and statement five concerning school district provided funds to purchase new technology ($r(51) = -.273, p = .048$), with 6 respondents (11.3%) indicating they either disagreed or strongly disagreed with the statement. A significant negative correlation was found between those that taught band and statement seven ($r(51) = -.363, p = .007$) with 15.1% who indicated they either disagreed or strongly disagreed with the statement. A significant negative correlation was also found between band teachers and statement eight ($r(51) = -.475, p < .000$) and statement nine ($r(51) = -.440, p = .001$). Of the respondents, seven disagreed or strongly disagreed with statement eight concerning training from the school district for any new technology required for use by the district (13.2%) and statement nine.

DISCUSSION

Responses to the TUIS (see Appendix A) demonstrated an increase in technology use that allow the educator to interact with the students during live instruction or allow the student to interact with a lesson to enhance learning. Increases in the use of recording equipment and video conferencing software indicate a rise in virtual learning. Even before the rise of virtual learning due to the onset of Covid-19 in many school districts across the four states included in this study, distance learning and the use of software for video conferencing (Waddell & Williamon, 2019). Many indicated they were using recording equipment before the onset of Covid-19, possibly for creating music videos as part of an assignment for their students (Murillo, 2017; Waddell & Williamon, 2019). Respondents indicated an increase in their comfort level with video conferencing software and LMS software such as Google Classroom, Schoology, Canvas, or Blackboard. Before Covid-19, researchers were finding that even though many teachers were comfortable using technology, integrating technology into their instruction depended partly on their literacy with those technologies (Aydin et al., 2016; Funkhouser & Mouza, 2012; Okojie et al., 2006; Russell et al., 2003; Teo, 2015). Those who sought out and participated in workshops had no change or a decrease in their comfort level using technology for specific tasks possibly due to having participated in those workshops early after the onset of Covid-19. Bauer et al. (2003) found the more time that lapses after training, especially if the educator is not using the techniques learned in that training regularly, the less likely they are to retain the information or use those skills.

Barriers preventing technology integration can often include a lack of funds for software and equipment, no support from their school or district, no proper training on technology implementation, and a belief that technology is not an essential component of music education. Those who reported their school locale as ‘City’ indicated a level of disagreement that their undergraduate programs had successfully prepared them to implement technology in their classroom. That result is consistent with findings from studies conducted during the 2010s that found technology is a part of the music educators’ curriculum during their pre-service years, but these classes tend to be stand-alone technology courses rather than technology integration instruction in their other coursework (Funkhouser & Mouza, 2013; Gorgoretti, 2019; Haning, 2016; Liu et al., 2015; Price et al., 2002).

Respondents who teach general music mostly agreed that their school provides adequate in-service training for new technology the school requires them to use but disagreed that their school considers it important to provide adequate funding for online music education subscriptions. Most of the band teachers from this survey disagreed that their school provides adequate funding for new technology equipment or online music education subscriptions, and that their school district provided them with adequate in-service training for the technology or software the school requires them to use for administration, planning, or instruction. The respondents who teach band mainly taught in rural schools where a lack of internet access could explain the lack of agreement with the statements concerning training and funds (An et al., 2021).

The low response rate for this survey must be considered in interpreting the results. NAFME has noted a significant drop in response rates for studies where they send multiple emails with the same information (R. Poorbaugh, personal communication, June 9, 2021). Therefore, the low response rate means the results of this study cannot be generalized to the whole population of the four states, but rather the results reveal a view into the specific classrooms of the respondents. Email surveys tend to be treated as junk mail, overlooked, or ignored. Recipients may not feel inclined to complete online surveys due to the high rate of online surveys many have received since the onset of Covid-19 (Ratekin, 2020). Studies have also found that surveys sent during certain times of the year, month, or week can result in low response rates (Fang et al., 2020). Future studies will need to consider this and select a better window when sending invitations for survey participation.

Educators find themselves coping with a lack of face-to-face time with their students, a decline in student participation, using new technologies without enough training, and the feeling of being overloaded in the new virtual world (An et al., 2021; Hash, 2021; Kaplan-Rakowski, 2020). Virtual learning requires teachers to quickly become proficient with the technology necessary to reach their students online (An et al., 2021). School district training sessions more often are centered around the technology the school requires them to use for administration, online lesson planning, and virtual teaching (An et al., 2021; Daniel, 2020). Pre-service educator programs had begun to incorporate technology training even before the onset of Covid-19 (Thomas et al., 2021). After the onset of Covid-19, music educators at all levels of education need to take “advantage of the growing music technology resources” (Thomas et al., 2021, p. 3)

they had not used before to teach music virtually. The results of this study implicate a need for more training specific to new and existing music technology, software, and online platforms.

A follow-up study using a shorter survey will seek to compare the results of this study to the results from music educators in surrounding states. Future studies will also investigate any changes in technology training for pre-service and in-service music educators since the onset of Covid-19. Covid-19 has changed the face of technology in education, and the effects of the pandemic “will likely linger for years” (Kaplan-Rakowski, 2020, p. 134). The onset of Covid-19 in February/March of 2020 and the effects of lockdowns and quarantines on schools presented music educators with unique challenges. Research conducted before the onset of Covid-19 revealed a slow embrace of technology in education through all levels of education, even with technology equipment, online platforms, and other digital resources for music education becoming more widely available. These results implicate training effectiveness for educators who need to become comfortable with using technology during their instruction. Course work for pre-service music educators before Covid-19 often did not provide technology-specific training. Future training for pre-service and in-service music educators should focus on technology that will be most useful to the music educator. The onset of Covid-19 shed light on the need for more technology training for all educators going forward. The results of this study can contribute to the ongoing conversation about the importance of technology training for pre-service and in-service music educators.

REFERENCES

- An, Y., Kaplan-Rakowski, R., Yang, J., Conan, J., Kinard, W., Daugherty, L. (2021). Examining K-12 teachers' feeling, experiences, and perspectives regarding online teaching during the early stage of the Covid-19 pandemic. *Education Tech Research Dev.* <https://doi.org/10.1007/s11423-021-10008-5>
- Aydin, M. K., Semerci, A., Gürol, M. (2016). Teachers' attitude towards ICT use in secondary schools: A scale development study. In D. Sampson, J. Spector, D. Ifenthaler, P. Isaías (ed.) *Proceedings of the 13th International Conference on Cognition and Exploratory Learning in the Digital Age, Mannheim, Germany, October 2016*, (pp. 375-377). <http://toc.proceedings.com/32407webtoc.pdf>
- Bauer, W., Reese, S., McAllister, P. (2003). Transforming music teaching via technology: The role of professional development. *Journal of Research in Music Education*, 51 (4), 289-301. <https://www.jstor.org/stable/3345656>
- Dammers, R. (2012). Technology-based music classes in high schools in the United States. *Bulletin of the Council for Research in Music Education*. 194, 73-90. <https://www.jstor.org/stable/10.5406/bulcouresmusedu.194.0073>
- Daniel, J. (2020). Education and the Covid-19 pandemic. *Prospects*, 49, 91-96. <https://doi.org/10.1007/s11125-020-09464-3>
- Dorfman, J. (2008). Technology in Ohio's school music programs: An exploratory study of teacher use and integration. *Contributions to Music Education*, 35, 23-46 <https://www.jstor.org/stable/24127161>
- Fang, Q., Burger, J., Meijers, R., & Berkel, K. (2021). The role of time, weather and google trends in understanding and predicting web survey response. *Survey Research Methods*, 15(1), 1-25. <https://doi.org/10.18148/srm/2021.v15i1.7633>
- Funkhouser, B., Mouza, C. (2013). Drawing on technology: An investigation of preservice teacher beliefs in the context of an introductory educational technology course. *Computers and Education*, 62, 271-285. <https://doi.org/10.1016/j.compedu.2012.11.005>
- Gorgoretti, B. (2019). The use of technology in music education in North Cyprus according to student music teachers. *South African Journal of Education*, 39 (1), 1-10. <http://doi.org/10.15700/saje.v39n1a1436>
- Haning, M. (2016). Are they ready to teach with technology? An investigation of technology instruction in music teacher education programs. *Journal of Music Teacher Education*,

- 25 (3), 78-90. <https://doi.org/10.1177/1057083715577696>
- Hash, P. M. (2021). Remote learning in school bands during the Covid-19 shutdown. *Journal of Research in Music Education*, 68(4), 381-397. <https://doi.org/10.1177/0022429420967008>
- Kaplan-Rakowski, R. (2020). Addressing students' emotional needs during the Covid-19 Pandemic: A perspective on text versus video feedback in online environments. *Education Tech Research Development*, 69(1), 133-136. <https://doi.org/10.1007/s11423020-09897-9v>
- Liu, S., Tsai, H., & Huang, Y. (2015). Collaborative professional development of mentor teachers and pre-service teachers in relation to technology integration. *Educational Technology and Society*, 18(3), 161-172. <https://www.jstor.org/stable/jeductechsoci.18.3.161>
- Murillo, R. E. (2017). The 21st century elementary music classroom and the digital music curriculum: A synergism of technology and traditional pedagogy. *Texas Music Education Research*, 14-27. <https://eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1183312>
- Norris, C., Soloway, E. (2020). The lesson of Covid-19: Learning at school and learning at home must be seamless. *The Journal*. <https://thejournal.com/Articles/2020/06/16/Seamless.aspx?Page=1>
- Okojie, M., Olinzock, A., & Okojie-Boulder, T. (2006). The pedagogy of technology integration. *The Journal of Technology Studies*. 32(2). 66-72. <https://scholar.lib.vt.edu/ejournals/JOTS/v32/v32n2/okojie.html>
- Portowitz, A., Peppler, K., & Downton, M. (2014). In harmony: A technology-based music education model to enhance musical understanding and general learning skills. *International Journal of Music Education*, 32(2), 242-260. <https://doi.org/10.1177/0255761413517056>
- Price, H. E., & Pan, K. C. (2002). A survey of music education technology at colleges in the southeastern USA. *Journal of Technology in Music Learning*, 1(2), 56-66. http://www.atmimusic.com/wp-content/uploads/2013/05/JTML.1.2f_PricePan_A-survey-of-music-education-technology-at-colleges-in-the-southeastern-USA.pdf
- Rahmadi, I. (2020). Teacher's technology integration and distance learning adoption amidst the Covid-19 crisis: A reflection for the optimistic future. *Turkish Online Journal of Distance Education*, 22(2), 26-41. <http://doi.org/10.17718/tojde.906472>

- Ratekin, M. (2020, November 19). Can sinking customer survey response rates ever be revived? *My Customer*. <https://www.mycustomer.com/customer-experience/voice-of-the-customer/can-sinking-customer-survey-response-rates-ever-be-revived>
- Reese, S., Rimington, J. (2000). Music technology in Illinois public schools. *Update: Applications of Research in Music Education*, 18 (2), 27-32. <https://doi.org/10.1177/875512330001800206>
- Russell, M., Bebell, D., O'Dwyer, L., O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of Teacher Education*, 54 (4), 297-310 <https://doi.org/10.1177/0022487103255985>
- Sehmann, K. H., & Hayes, C. (1996). The status of computer technology in Kentucky's music classrooms. *Southeastern Journal of Music Education* 9, 26-34
- Spoel, I., Noroozi, O., Schuurink, E., Ginkel, S. (2020). Teachers' online teaching expectations and experiences during the covid-19 pandemic in the Netherlands. *European Journal of Teacher Education*, 43(4), 623-638. <https://doi.org/10.1080/02619768.2020.1821185>
- Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers and Education*, 57(4), 2432-2440. <http://doi.org/10.1016/j.compedu.2011.06.008m>
- Teo, T. (2015). Comparing pre-service and in-service teachers' acceptance of technology: Assessment of measurement invariance and latent mean differences. *Computers and Education*, 83, 22-31. <https://doi.org/10.1016/j.compedu.2014.11.015>
- The National Report Card. (n.d.). *State profiles*. <https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=&sfj=NP&st=MN&year=2019R3>
- Thomas, M., Norgaard, M., Stambaugh, L., Atkins, R., Kumar, A., Farley, A. (2021). Online involvement for Georgia student teachers during Covid-19. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.648028>
- Waddell, G., Williamon, A. (2019). Technology use and attitudes in music learning. *Frontiers in ICT*. <https://doi.org/10.3389/fict.2019.00011>
- West, R. & Graham, C. (2005). Five powerful ways technology can enhance teaching and learning in higher education. *Educational Technology*, 45 (3), p. 20-27. <https://www.jstor.org/stable/44429208>

APPENDIX A: Technology Usage and Integration Survey

1. What is your birth-assigned sex?
 - ☐ Male
 - ☐ Female
 - ☐ Prefer not to answer
2. How many total years of teaching experience have you completed?
Type the number (for example 1, 2, 12, 14, etc.). _____
3. What is your highest earned degree?
 - ☐ Associate's Degree
 - ☐ Bachelor's Degree
 - ☐ Master's Degree
 - ☐ Education Specialist or Master's +30
 - ☐ Doctoral Degree
 - ☐ Other, please indicate: _____
4. Where is your school's locale classification?
 - ☐ City - defined as a school inside a principal city/urbanized area with a population of 100,000 to 250,000
 - ☐ Suburban - defined as a school outside a principal city but inside an urbanized area with a population of 100,000 to 250,000
 - ☐ Town - defined as a school inside an urban cluster but 10 to 35+ miles from an urbanized area
 - ☐ Rural - defined as a school that is 2.5 to 25+ miles from an urbanized area or urban cluster
5. In which state do you currently teach?
 - ☐ Alabama
 - ☐ Louisiana
 - ☐ Arkansas
 - ☐ Mississippi
6. What areas in music do you currently teach? (Select all that apply).
 - ☐ General Music
 - ☐ Choir/Show Choir
 - ☐ Band/Marching Band/Jazz Band
 - ☐ Orchestra (Strings, Wind, and Percussion)
 - ☐ Strings
 - ☐ Guitar
 - ☐ Keyboard
 - ☐ Voice

- ☐ Technology
 - ☐ History/Theory/Composition
 - ☐ Other, please specify: _____
7. What forms of training have you received specific for technology use, and/or technology integration into instruction after the onset of Covid-19? (Select all that apply).
- ☐ Undergraduate coursework
 - ☐ Graduate coursework
 - ☐ Independent research/training
 - ☐ School District provided training
 - ☐ Workshops offered by colleges/universities
 - ☐ Attending Presentations at Professional Conferences
 - ☐ Workshops through Professional Organizations
 - ☐ Workshops offered by other, please specify: _____
 - ☐ Other, please specify _____
8. How often have you explored new software/apps to support your teaching and/or your students' learning since the onset of Covid-19?
- ☐ Never
 - ☐ A Few Times Per Year
 - ☐ Once Per Month
 - ☐ A Few Times Per Month
 - ☐ Once Per Week
 - ☐ A Few Times Per Week
 - ☐ Daily

9. How often DID you use the following software and hardware technologies BEFORE the onset of Covid-19 in February/March of 2020?	Never	At least once per year	At least once per month	At least once per week	Daily
Office tools for creating word documents (such as Word, Google Docs, etc.)	☐	☐	☐	☐	☐
Office tools for creating spreadsheets (such as Excel, Google Sheets, etc.)	☐	☐	☐	☐	☐
Office tools for creating multimedia presentations (such as PowerPoint, Smart Notebook, Google Slides)	☐	☐	☐	☐	☐
Office tools for creating databases (such as Microsoft Access, OpenOffice, etc.)	☐	☐	☐	☐	☐
Planning, administration, and classroom management software or online programs	☐	☐	☐	☐	☐

(Q 9 continued)	Never	At least once per year	At least once per month	At least once per week	Daily
Music Notation Software (such as Finale, Noteflight, Sibelius, etc.)	☐	☐	☐	☐	☐
Software for Recording and Editing (such as Audacity, Audition, etc.)	☐	☐	☐	☐	☐
Software for Recording that ALSO allows for Sequencing (such as GarageBand, Logic, Studio One, Cakewalk, Mixcraft, etc.)	☐	☐	☐	☐	☐
Using a MIDI-type controller (for example to enter notes into a software program)	☐	☐	☐	☐	☐
Software-based Instruments (for example using MIDI and connecting to a specific virtual instrument sound)	☐	☐	☐	☐	☐
Using Recording Equipment (Microphones, Mixers, Video Cameras, etc.)	☐	☐	☐	☐	☐
Software for Creating CDs for practice and/or accompaniment	☐	☐	☐	☐	☐
Electronic Instruments (such as Digital Keyboards, Guitars, Drum Pads, etc.)	☐	☐	☐	☐	☐
Online Platforms/Interactive Websites (such as Quaver, MusicPlay, Interactive Instruments, Google Classroom, My Choral Coach, Smart Music, etc.)	☐	☐	☐	☐	☐
Video Conferencing Software (such as Google Hangout, Zoom, WebEx, Facetime, etc.)	☐	☐	☐	☐	☐
Music Education Apps for Tablet-like devices (such as iPads, Chrome Books, etc.)	☐	☐	☐	☐	☐

10. How often HAVE you used the following software and hardware technologies SINCE the onset of Covid-19 in February/March of 2020?	Never	At least once per year	At least once per month	At least once per week	Daily
Office tools for creating word documents (such as Word, Google Docs, etc.)	☐	☐	☐	☐	☐
Office tools for creating spreadsheets (such as Excel, Google Sheets, etc.)	☐	☐	☐	☐	☐
Office tools for creating multimedia presentations (such as PowerPoint, Smart Notebook, Google Slides)	☐	☐	☐	☐	☐
Office tools for creating databases (such as Microsoft Access, OpenOffice, etc.)	☐	☐	☐	☐	☐
Planning, administration, and classroom management software or online programs	☐	☐	☐	☐	☐
Music Notation Software (such as Finale, Noteflight, Sibelius, etc.)	☐	☐	☐	☐	☐
Software for Recording and Editing (such as Audacity, Audition, etc.)	☐	☐	☐	☐	☐
Software for Recording that ALSO allows for Sequencing (such as GarageBand, Logic, Studio One, Cakewalk, Mixcraft, etc.)	☐	☐	☐	☐	☐
Using a MIDI-type controller (for example to enter notes into a software program)	☐	☐	☐	☐	☐
Software-based Instruments (for example using MIDI and connecting to a specific virtual instrument sound)	☐	☐	☐	☐	☐
Using Recording Equipment (Microphones, Mixers, Video Cameras, etc.)	☐	☐	☐	☐	☐
Software for Creating CDs for practice and/or accompaniment	☐	☐	☐	☐	☐
Electronic Instruments (such as Digital Keyboards, Guitars, Drum Pads, etc.)	☐	☐	☐	☐	☐
Online Platforms/Interactive Websites (such as Quaver, MusicPlay, Interactive Instruments, Google Classroom, My Choral Coach, Smart Music, etc.)	☐	☐	☐	☐	☐
Video Conferencing Software (such as Google Hangout, Zoom, WebEx, Facetime, etc.)	☐	☐	☐	☐	☐
Music Education Apps for Tablet-like devices (such as iPads, Chrome Books, etc.)	☐	☐	☐	☐	☐

11. How COMFORTABLE were you with completing these TASKS using various forms of technology BEFORE the onset of Covid-19 in February/ March of 2020?	Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
Class or Program Administration Software (such as Charms)	☐	☐	☐	☐	☐
Managing Online Files (such as Google Drive, Dropbox, etc.)	☐	☐	☐	☐	☐
Transcribing Notation	☐	☐	☐	☐	☐
Composing/Arranging Using Notation Software	☐	☐	☐	☐	☐
Composing/Arranging using Sequencing Software	☐	☐	☐	☐	☐
Recording Audio	☐	☐	☐	☐	☐
Editing Audio	☐	☐	☐	☐	☐
Recording Video	☐	☐	☐	☐	☐
Editing Video	☐	☐	☐	☐	☐
Running Choir and/or Band rehearsals	☐	☐	☐	☐	☐
Teaching/Supporting Music Theory Content	☐	☐	☐	☐	☐
Teaching/Supporting Music History Content	☐	☐	☐	☐	☐
Teaching Classes like Class Piano, Class Guitar, etc.	☐	☐	☐	☐	☐
Giving One-to-One Instruction (such as Individual Voice or Instrument Lessons)	☐	☐	☐	☐	☐
Online Video Conferencing Instruction	☐	☐	☐	☐	☐
Course Learning Management (such as Canvas, Blackboard, Google Classroom, Schoology, etc.)	☐	☐	☐	☐	☐

12. How COMFORTABLE have you become completing these TASKS using various forms of technology SINCE the onset of Covid-19 in February/March of 2020?	Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
Class or Program Administration Software (such as Charms)	☐	☐	☐	☐	☐
Managing Online Files (such as Google Drive, Dropbox, etc.)	☐	☐	☐	☐	☐
Transcribing Notation	☐	☐	☐	☐	☐
Composing/Arranging Using Notation Software	☐	☐	☐	☐	☐
Composing/Arranging using Sequencing Software	☐	☐	☐	☐	☐
Recording Audio	☐	☐	☐	☐	☐
Editing Audio	☐	☐	☐	☐	☐
Recording Video	☐	☐	☐	☐	☐
Editing Video	☐	☐	☐	☐	☐
Running Choir and/or Band rehearsals	☐	☐	☐	☐	☐
Teaching/Supporting Music Theory Content	☐	☐	☐	☐	☐
Teaching/Supporting Music History Content	☐	☐	☐	☐	☐
Teaching Classes like Class Piano, Class Guitar, etc.	☐	☐	☐	☐	☐
Giving One-to-One Instruction (such as Individual Voice or Instrument Lessons)	☐	☐	☐	☐	☐
Online Video Conferencing Instruction	☐	☐	☐	☐	☐
Course Learning Management (such as Canvas, Blackboard, Google Classroom, Schoology, etc.)	☐	☐	☐	☐	☐

13. How much do you agree or disagree with the following statements?	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I consider the integration of technology as an important component to music education.	☐	☐	☐	☐	☐
My undergraduate program prepared me to implement technology integration in my classroom.	☐	☐	☐	☐	☐
My graduate program prepared me to implement technology integration in my classroom.	☐	☐	☐	☐	☐
Most of my students have adequate technology access in my classroom.	☐	☐	☐	☐	☐
My school district considers it important to provide me with adequate funding to purchase new technology equipment.	☐	☐	☐	☐	☐
My school district considers it important to provide me with adequate funding to purchase new software.	☐	☐	☐	☐	☐
My school district considers it important to provide me with adequate funding to purchase subscriptions to online music education platforms.	☐	☐	☐	☐	☐
My school district considers it important to provide me with adequate in-service technology training for new tools and software they require me to use for administration and planning.	☐	☐	☐	☐	☐
My school district considers it important to provide me with adequate in-service technology training for new tools and software they require me to use for instruction.	☐	☐	☐	☐	☐
My school district considers it important to provide me with funds to seek out outside district training specific to music technology.	☐	☐	☐	☐	☐

14. SURVEY ENDING

Optional: If you have any comments about this topic or this study, please feel free to type them below. Please click the next button to finish this survey.

ABOUT THE AUTHOR

Dr. Holliman is a graduate of Delta State University with a Bachelor in Music Education and received her Master in Music Education from the University of Southern Mississippi. She recently graduated from Auburn University with her Doctorate in Music Education with an emphasis in music technology for instruction. Dr. Holliman is in her seventeenth year at Riverside Schools as the music director, teaching High School and Junior High Choir, as well as Elementary General Music. She served as the District III Chairman from 2011 to 2018 and is currently serving as the Chairman of the Mississippi Prescribed List Committee. Dr. Holliman also assisted the MMEA during the membership drive in 2016. She is also the recipient of the 2011 Mississippi Music Educators Association Outstanding Young Music Teacher of the Year Award. Dr. Holliman also teaches private voice lessons out of studio, Holliman Voice Studio. She has also created a website dedicated to helping music educators learn about different technologies and teaching techniques that can be integrated into their instruction.

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