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THE EFFECTIVENESS OF DIGITAL TECHNOLOGY  
IN K-12 STRINGS AND ORCHESTRA CLASSROOMS

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## ABSTRACT

The purpose of this study was to explore the effectiveness of digital technology in K-12 Strings and Orchestra Classrooms. Members from the American Strings Teachers Association were contacted to participate in an online survey asking about their experiences, perspectives, and preferences with digital technology within their strings and orchestra classrooms. The aim of this survey was to collect data about what digital technologies are being used, how effective teachers have found them, why teachers find them effective, and what teachers prefer to use with their students.

The results indicated that over 95% of the surveyed American strings and orchestra teachers do use digital technology in their string and orchestra classrooms. Each type of digital technology listed in the distributed survey was ranked as over 50% effective in strings and orchestra classrooms. Recording devices, YouTube videos, and notation devices were rated the most effective. Participants found themselves most proficient with using YouTube, music websites, and recording devices. The top three digital technology devices that teachers chose as their favorites include recording devices, YouTube videos, and Smart Music. Many teachers did not receive much training for learning to use many of the digital technology devices. They reported receiving the most training with PowerPoint or slideshow presentations, notation software, and SmartBoards. Digital technology has proven very effective in strings and orchestra classrooms and can enhance a curriculum and further engage students.

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## **Chapter 1**

### **INTRODUCTION & RATIONALE**

#### **Introduction**

Every teacher has his or her own personal goals and objectives. To meet these goals and objectives, teachers utilize a variety of materials. In our constantly advancing world of technology, many teachers have chosen to utilize different types of digital technology devices into their classrooms. Only having observed a handful of America's strings classrooms, I became curious as to what digital technologies teachers are using in their classrooms, if any, and how effective teachers find these technologies.

One might raise the question, "What's wrong with the traditional way? What does all of this new technology really have to offer anyways?" I must admit that I have pondered the same question. Is all of this fancy digital equipment and technology really benefiting students? I aimed to find out.

#### **Rationale**

The average kid listens to two and a half hours of music each day, almost five hours of TV and movies, three hours of Internet and video games, and just 38 minutes of old-fashioned reading, according to a new study by the Kaiser Family Foundation (ABC News, 2010). This totals about 75 hours of time using digital technology each week and does not even include cell phone time. Unquestionably, digital technology plays a huge

part in the lives of kids in our modern world. It entertains, interests, and engages them in a way that keeps them focused and concentrated for long periods of time. Why not incorporate the digital technology that they are so devoted to into an educational setting?

Many teachers already make use of digital technology in their classrooms.

Through this project, I investigated the digital technology being used specifically in K-12 strings and orchestra classrooms throughout the United States. All classrooms are different and use digital technology in different ways, hence, making different impacts on the students. Which digital technologies are the most effective? What do teachers find the most useful? Through research, common factors arose amongst teachers when looking into what digital technology to select for the classroom. Teachers widely valued digital technology for its accessibility and convenience, its use as an assessment tool, and its versatility and modernity.

#### **Accessibility and Convenience.**

The innovation of digital technology has made certain things more accessible than they used to be. It's hard to remember back to the days when we couldn't look up a song on YouTube or take out our Smart phones and take a picture or a video. So many things are at our fingertips now; handheld devices such as Smart phones and tablets, in particular, have really changed the way that we live. Specifically, teachers in strings and orchestra classrooms, or any music classroom for that matter, would not have to worry about preparing lots of extra materials (besides instruments, room set up, etc.). They can just use one device for most everything and simplify tasks that might have taken much

longer without digital technology. John Kuzmich, Jr. (2010) describes an easy way for tuning through the music app, iStroboSoft, “The glowing sharp and flat indicators simplify tuning when it is difficult to determine which direction the strobe is moving...it also filters noise [which is] helpful when using an external mic or clip-on tuning device” (p. 24). Speaking from personal experience, it wastes so much time tuning every single string player in the orchestra. If students could use an app to make tuning a bit easier, or even use a tuner that shows if you are sharp or flat, more time could be used making music instead of turning pegs. Of course, using phones in the classrooms to access apps may not be an option, but other types of digital tuners can also be used. Phones can be used at home to help with tuning, where there isn't a teacher present to help with the process.

Not only are tuners more accessible, but metronomes, recording devices, cameras, and much more can all be found in a Smart phone or a tablet. Students could even look up a music dictionary or a fingering chart at home, when they cannot ask their teacher (Criswell, 2009). Chad Criswell states, “With these devices, teachers and students now have potential access to hundreds of applications that, when used properly, can serve as a positive influence on a student's learning and exploration of music” (p. 26).

Strings and orchestra teachers often have to balance many jobs at once. For example, a typical day may include teaching orchestra, teaching lessons, answering messages from parents and administrators, creating a concert program, entering grades, and preparing a score. With a job like this, efficiency is key. Of course, digital technology will not do the work for you, but if used correctly, it can certainly make life easier. Holding states, “[The] once cumbersome and expensive aspects of self-

management have been utterly transformed by digital media. Tasks like producing recordings...distributing publicity photos and networking with other professionals can all be accomplished in record time, with polished results on the slimmest of budgets” (Helding, 2011, p. 200).

With the help of digital technology, students can even learn long-distance. Geography is not the barrier that it used to be (Welsh 2012). Pinchas Zuckerman, a highly respected violinist and teacher states, “It saves time, it saves money. If you talk to my students, they’ll tell you they learn things tenfold, practically” (Williams, 2010). Zuckerman has online archives of all of the video lessons with his students, and other students can watch past lessons that Zuckerman taught for the same piece they are working on. It enables them to learn quicker and see many different examples of playing (p. 55).

One such example of a long-distance learning scenario is a high school violist, Susan Bengtson, who lives in a rural area of Washington. She used to travel seven hours for weekly lessons to study with a teacher in the metropolitan area. However, she discovered Cleveland Institute of Music’s distance learning department and she was able to take lessons over the Internet. Bengtson states, “It’s been amazing--life changing, really...” (Welsh, 2012, p. 61). One major benefit from long-distance learning is that the student can watch their lesson on DVD and go over what they should work on as well as look back at their teacher’s modeling (Welsh, 2012).

Long-distance learning is not for everyone, but it is certainly better than nothing, especially if you live in a rural area where private music teachers are not prevalent. Beginners, in particular, may not find much luck in this type of learning because it is

difficult to show basic skills, such as a bow hold, and the teacher cannot exactly reach through the computer and adjust their fingers. Those with more experience would find more success (Welsh, 2012).

### **Assessment.**

Education is undergoing many changes at this time. One major change is that teachers are being held more accountable and must give more assessments to demonstrate how students are progressing in their classrooms. For strings and orchestra teachers, as well as other instrumental music teachers, assessment can be a challenge when there are 80 students in your classroom.

In a large ensemble setting, digital recorders can be wonderful assessment tools for strings and orchestra teachers. It's difficult to hear each individual student in a group, and by having them record themselves outside class, the teacher is able to fix problems more easily and give specific feedback to the student. It is not the same as sitting next to them and showing them how to make changes, but that is not always possible in a large ensemble. SmartMusic is one type of recording device, more specifically interactive software, which allows students to play along with the music and even receive brief feedback to improve. Kevin Mead, a Band Director in Churchville, N.Y. observed, "My students have learned that I listen and analyze their SmartMusic assignments very carefully. This has taught them to listen to their own performance more critically and make improvements before they submit their recorded assessments" (Kuzmich, 2012a, p. 36).

Using recording devices cannot only serve as a form of assessment, but it can help students become better performers. Kuzmich (2012a) states, “I’ve discovered that stress levels are reduced when I regularly record students in preparation for their auditions” (p. 37). Performing can be frightening for many people, but when you are used to having your performances listened to and assessed over and over, it can become a bit easier and more natural. For centuries, verbal reflection and feedback was used as the primary assessment tool (Kuzmich, 2012b). Now, students can hear recordings of themselves, which can really motivate and stimulate students to improve.

In the setting of a private lesson, or even in small group lessons at school, teachers can use cameras to take pictures of students’ hand positions and postures (Fedson 2010). Fedson states, “[I] immediately email the photos home so that the students and their parents have easy visual reference for home practice” (p. 68). Again, these photos can be taken directly from a Smart phone. Moreover, there are apps to take videos and record students without having to get a bunch of recording equipment out. During the lesson, the teacher can record and play back what the student has just played so they can analyze and talk about how to improve. Students can also record themselves at home and evaluate how they thought they did.

Another tool that students can use is a program to slow down music. One example is The Amazing Slow Downer, an app that alters the speed of a pre-recorded mp3 without changing the pitch (Fedson, 2010). By using this technology, students can work at their own pace and hear articulations or complex rhythms at a speed that is easier to process.

### **Versatility and Modernity**

String education is evolving and adapting many eclectic styles of music. It would be an injustice to string students to limit their repertoire to just Classical music. Whether or not you are trained with a jazz or rock background, digital technology has made it simple to learn how to teach and play these different styles. Listening to live performances is the first step to learning how to play different styles of music and is extremely important if you want to play the style authentically (Kuzmich 2001). There are sites online that show how to teach improvisation and many charts to teach the modern styles as well.

Orchestras are being modernized with electric instruments, pickups and MIDI Synthesizers (Kuzmich, 2001). Electric instruments or pickups can compel kids to be more engaged and excited to play music. They see electric instruments on TV and in music videos constantly, and electric instruments are in most of the music that they listen to. Pickups are the least expensive way to amplify an acoustic string instrument. A few electric instruments have frets, which can support improvisational technique and help students to better visualize where to place their fingers (Kuzmich, 2001).

### **Summary**

Dr. John Kuzmich Jr. (2012b) states, “As music educators, we need to embrace technology and understand how to utilize these new tools to inspire our 21<sup>st</sup> century students” (p. 46). Digital technology should not be the sole tool to teach strings, but it can be an incredible supplement and can help keep students engaged and excited about

coming to orchestra. It is more accessible, convenient, versatile, and a great assessment tool for both teachers and students to track progress.

## **Chapter 2**

### **LITERATURE REVIEW**

The purpose of this literature review is to explore previous the pre-existing research in the field of digital technology in classrooms, most importantly in music and orchestra classrooms. The following research shows that digital technology reaches a wide range of learners, improves learning capacity and engagement, supports a learner-centered classroom, and also discusses the disadvantages of using digital technology.

#### **Range of Learners**

Digital technology has the ability to reach a diverse range of learners. According to Howard Gardner's Theory of Multiple Intelligences, there are nine distinct types of learners. These include: verbal, logical, visual kinesthetic, musical, intrapersonal, interpersonal, naturalist, and existential (McKenzie, 2005). Each of these intelligences can be supported and accommodated for by digital technology in a learning environment. Teachers need to know their students and how they learn best, in order to help them succeed and reach their highest learning potential. If some students learn better by hearing, and others learn better by seeing, a teacher should provide a learning environment that encompasses both of these in order to reach out to both students. "Combining students' learning-preference data with their multiple-intelligence data should give teachers strong evidence for how they can plan effective, intellectual-power-boosting lessons" (Morphew, 2012).

**Table 1: Digital Technologies that address multiple intelligences**

<b>Intelligence</b>	<b>Technologies</b>
<b>Verbal</b>	Word processors, electronic mail, desktop publishing tools, Web-based publishing tools, keyboards, speech recognition devices, text bridges
<b>Logical</b>	Graphing calculators, spreadsheets, search engines, directories, FTP clients, gophers, WebQuests, problem-solving tasks, programming languages
<b>Visual</b>	Overhead projectors, televisions, videos, slideshows, monitors, digital cameras and camcorders, scanners, graphics editors, HTML editors, digital animation/movies
<b>Kinesthetic</b>	Simulations that require eye-hand coordination, assistive technologies, digital probes
<b>Musical</b>	Headphones, tape players, tape recorders, digital sounds, online pattern games, multimedia presentations, speakers, CD-ROM discs, CD-ROM players
<b>Intrapersonal</b>	Online surveys, online forms, digital portfolios with self-assessments
<b>Interpersonal</b>	Telephones, walkie-talkies, intercoms, board games, costumes, collaborative projects, chats, message boards, instant messengers
<b>Naturalist</b>	Laserdiscs, floppy drives, file managers, semantic mapping tools
<b>Existential</b>	Virtual field trips, MUDs, blogs, wikis, virtual reality, simulations

Adapted from McKenzie (2005)

For each individual type of intelligence, there are digital technologies to aid and benefit their learning method. McKenzie (2004) states, “[It] is clear that the day is past where educators teach the text book and it is the dawn of educators teaching each child according to their orientation to the world”. There are endless possibilities for creativity in every student. Teachers can either choose to invite students to explore their full potential or stifle their opportunities by withholding the support of supplements that accommodate their individual learning style (Morphew, 2012).

Digital technology can also reach out to students with special needs. Teachers are constantly challenged to meet the needs of students with varying needs and abilities

including social, emotional, and physical needs (Clark, 2003). In a recent study, at-risk students in a middle school music class were divided into an experimental and a control group. The experimental group received a higher concentration of technology, while the control group did not. The results did not show a major statistical significance, however, they did show a remarkable degree of consistency within the experimental group that received a greater focus on technology in the classroom. There was also an implication that the technology had a positive effect on the motivation, attitudes, and behaviors of at risk students (Clark, 2003).

In another study in Austin, Texas, a Next-Century School was given a three-year grant to restructure education for at risk students (Forest, 1995). First grade music students focused on internalizing musical concepts and transferring these concepts to instruments using technology. Fifth grade students used keyboard labs, interactive MIDI software, a drum machine, and a synthesizer. Both first and fifth grade students were reportedly much more engaged and captivated. Because music technology was a part of their curriculum, the district statistician reported that Ortega is "off the charts" with scores that consistently exceed district (Forest, 1995). The children were also demonstrating a greater understanding of the skills and were proud of their musical abilities.

### **Learning Capacity, Engagement and Motivation**

“Music is engaging in the sense that it implicates our hearts and minds. Music can also be engaged by and with the media. And, of course, engagement is core to

effective learning” (Carruthers, 2009, p. 1). Students are more engaged because technology enables them to think differently and do things more easily and better than they have done them before.

A recent study aimed to determine if the “implementation of instructional technology in elementary general music classes would have a positive effect on the lessons for composing music, to investigate what kind of technology was available for a classroom using just one computer, and to test if it was feasible to use that technology” (Mato, p. 2). The study involved 5<sup>th</sup> grade students at a school in Maryland and was about teaching them how to compose a short piece of music. The experimental group had the benefit of SMART Board technology and software, while the control group did not. The results showed that there was a significant increase of basic knowledge of note writing and reading skills necessary for composition in the experimental group (Mato). The findings support this statement: Integrating technology in music can enhance student learning and benefit students with different backgrounds (Mato, p.17).

Technology can help students to research music, find access to music forums, and network with music artists and composers (Crawford, 2009, p. 159). This increases the potential for meaningful interaction and brings the outside world into the classroom. Students have the opportunity to have real world experiences, without traveling all over the world. “An element of authenticity is added when online tasks and materials are used by teachers. Many such sites reflect real world situations, thus they contain “authentic data” (Crawford, 2009, p. 159). According to Crawford, the main goal in music education now is to develop an approach to using technology that reflects contemporary times (Crawford, 2009, p. 165).

The key to keeping students engaged and focused in the classroom is showing a variety of music and keeping up with modern times. In this modern world, it is important to keep aligned with state and national standards in order to keep up with other programs and give all students more equal opportunities and experiences in music education.

Because the predominance of American students in music classrooms are familiar and experienced with many types of digital technological devices, such as laptops, iPads, and Smart phones, music technology can be used as a great tool to support the National Standards for Music Education (Rudolph, 2004).

1	Singing, alone and with others, a varied repertoire of music.
2	Performing on instruments, alone and with others, a varied repertoire of music.
3	Improvising melodies, variations, and accompaniments.
4	Composing and arranging music within specified guidelines.
5	Reading and notating music.
6	Listening to, analyzing, and describing music.
7	Evaluating music and music performances.
8	Understanding relationships between music, the other arts, and disciplines outside the arts.
9	Understanding music in relation to history and culture.

The National Standards (NafME, 2014)

Rudolph states, “Technology can be used to enhance all the skills or knowledge areas of the nine standards (Rudolph, 2004, p. 11). Often, it is difficult to attain all nine standards. According to a recent study, the least favorably perceived standards include:

composing and arranging music within specific guidelines, understanding relationships between music, the other arts, and disciplines outside the arts (Riley, p. 1). Instructional software, however, can make achieving these unfavorable standards easier and more entertaining. For example, Final or Sibelius could be used to help compose music and the software is more engaging and innovative than just sitting down with staff paper and a pencil.

Teachers have found that students are more motivated and actually spend an increased amount of time learning when they use mobile devices and other forms of technology (Crawford, 2009). Many older, traditional means for expression attitudes and emotions have been replaced or expanded by technological innovation (Carruthers, 2009, p. 7). Hence, it is very important for teachers to be aware of the comprehensive capabilities of digital technology tools and how they can enhance the student learning process.

### **Learner-Centered Classroom and Assessment**

Spanos, Hansen, and Daines (2001) examine the shift from a teacher-focused classroom to a more student-focused classroom in foreign language classes (p. 1). In the student-centered model, the student is more responsible for learning and the teacher is not the main source of information. In this new style of classroom, teachers need concrete evidence that students are learning. They need to know what the students know and what they are able to do. According to Spanos, Hansen, and Daines (2001), “Without accurate assessment techniques, used on a regular basis, we are “flying blind” and will be unlikely

to adjust our teaching plans in ways that will increase our students' learning" (p. 318).

Using digital technology is a logical step for formative and informative assessment.

In these classes, students were to send in assignments through an online forum. According to the students, they believed that the instructor was interested in what they had learned and not just the grades of their tests and papers. The classroom assessment in the foreign language classes has been greatly facilitated by the utilization of technology (p. 323). Students receive valuable and immediate feedback and teachers can assess more quickly whether or not students understand concepts.

SmartMusic is one example of an assessment tool used to track progress of music students. Multiple independent research studies have proven the positive effects of this software. James Karas, of University of Nebraska, states, "Correlations to *SmartMusic* scores and the average of the four judges were significant. *SmartMusic* seemed to be very effective in scoring students ability to read notation. There was a high correlation between the four judges and *SmartMusic* scores" (SmartMusic). In another independent study conducted by Michael Buch of University of Southern Mississippi, "Ninety-four percent of the SmartMusic assessment group reported individual practice "a little bit," "sometimes" or "a fair amount" (SmartMusic). SmartMusic is a great assessment tool to watch the progress and evaluate students with. This is especially useful in large ensembles, where teacher does not get a chance to hear every student.

### **Disadvantages**

Digital technology is not a miracle worker; students will not automatically improve if a laptop is put in front of them. “It is unlikely that technology will improve learning without a powerful vision and without thoughtful and creative teachers challenging student to go beyond traditional expectations of achievement” (November, 2010, p.4). Teachers need to be trained and educated about the technology that they decide to use in the classroom, or else it could prove as ineffective. According to Arostegui (2010), “94% of music teachers demand more training, although 83% say that they have some knowledge” (p. 21).

Moreover, having computers or technology does not guarantee anything and having Internet access will not make students smarter (Wetzel, 1999, p. 34). Teachers must ensure that the technology they decide to use aligns with the curriculum and assessments that are to be given.

Lastly, digital technology could also serve as a distraction in the classroom and cannot solve all problems. For example, wireless devices can help students communicate and access online resources, but they could also be off-task and not focusing on the teacher’s lesson for the same reason (Liu, 2007).

### **Summary**

The incorporation of digital technology has proven many positive effects, as shown by research studies. Digital technology has the ability to reach a wide range of learners and accommodate to their individual needs. Each student, no matter what the

intelligence level, ethnic background, or age level can benefit from the incorporation of digital technology into the classroom. Digital technology also helps to increase the learning capacity of students and intensify their motivation and engagement levels. Moreover, it modernizes classrooms and can help teachers keep aligned with national standards. Digital technology also supports a learner-centered classroom and aids students in being able to find information more independently. Additionally, it can be used as a form of assessment that is more authentic and gives concrete evidence of skills and abilities. Lastly, digital technology will not solve all problems, but rather, should be used in a way that connects with the curriculum and enhances the learning process.

### **Chapter 3**

## **METHODOLOGY**

The purpose of this study was to explore the effectiveness of digital technology in K-12 Strings and Orchestra Classrooms. The guiding questions for this project were:

1. What specific types of digital technology, if any, are strings and orchestra teachers currently using?
2. What types digital technologies have proven to be most effective in strings and orchestra classrooms?

### **Design of Study**

This study uses a quantitative design in the form of an online survey created through Survey Monkey. I contacted a representative from the American String Teacher's Association and was able to send a mass email message out to members of ASTA asking for them to voluntarily participate in my survey. The email sent to ASTA members can be found in Appendix B.

The survey consisted of fifteen questions designed to collect information about digital technology in modern orchestra and strings classrooms, its effectiveness, which specific technologies teachers are using, and their backgrounds.

The survey questions answered by members of American String Teacher's Association can be seen in Appendix A.

I submitted my online survey, entitled, The Effectiveness of Digital Technology in K-12 Strings & Orchestra Classrooms, along with the online application to the Office for Research Protections through PRAMS on July 28, 2013. PRAMS is Penn State University's electronic submission system. My application was assigned IRB #43634 and the study was determined exempt from the International Review Board's review.

### **Participants**

The participants were all members of the American String Teachers Association and each participant teaches orchestra or strings in grades K-12. The survey was emailed October 8, 2013, via Constant Contact, and was sent to 2,181 K-12 string teachers. There were 719 people who opened the survey, and of those, 226 people clicked on a link within the email. There were 205 total participants that fully answered the survey questions. They each took the survey voluntarily and a request was sent through the ASTA email listserv that they receive as being members of the organization.

### **Data Collection Tools**

My results from SurveyMonkey were exported into a Microsoft Excel file. The data was organized and collected using different formulas to find sums, averages, and count numbers. A few questions required a typed response from participants. These responses were organized into more categories to show the data in a numerical format. The data was then put into tables to show percentages and results from the survey. The tables can be found in Appendix C.

## Chapter 4

### RESULTS

Of the 205 members of the American String Teacher's Association who participated in the online survey, 95.8% of strings and orchestra teachers use digital technology in their strings and orchestra classrooms.

Table 2 shows teacher responses when they were asked how effective they found each specific type of digital technology as well as how proficient they believed they were for each one.

**Table 2: Effectiveness and Proficiency of Digital Technology**

<b>Type of Digital Technology</b>	<b>% Effectiveness as ranked by American strings and orchestra teachers</b>	<b>% Proficiency as ranked by American strings and orchestra teachers</b>
Recording Devices	88.6%	83.1%
YouTube Videos	84.8%	88.1%
Smart Boards	76.3%	56.0%
Music Websites	78.7%	83.5%
Social Media (Facebook, Twitter, etc)	56.1%	71.9%
Podcasts	55.7%	53.3%
iPads	76.4%	70.1%
Notation Software Programs (Finale, Sibelius, Noteflight, etc)	85.3%	75.8%
Smart Music	74.4%	64.1%
Music Apps	77.1%	68.7%
Amplification Devices speakers, microphones, instrument pick-ups, etc)	84.5%	77.8%
Electric Instruments	72.7%	69.5%
PowerPoint or Slideshow Presentations	71.2%	77.2%

For a majority of the types of digital technology, teachers found them more effective than they considered themselves proficient. Each type of digital technology was found to be over 50% effective by members of the American String Teacher's Association. The top three digital technology devices that teacher found most effective were found to be: recording devices, YouTube videos, and notation software. The top three digital technology devices that teachers found themselves to be most proficient at using include: Youtube videos, music websites, and recording devices.

For the Table 3, teachers were asked about how much training that had received for each specific digital technology device. The training could have been received through school or an outside workshop.

**Table 3: Digital Technology Training**

<b>Type of Digital Technology</b>	<b>% Received Training on Specific Digital Technology</b>
Recording Devices	22.7%
YouTube Videos	10.7%
Smart Boards	37.4%
Music Websites	24.4%
Social Media (Facebook, Twitter, etc)	5.8%
Podcasts	12.5%
iPads	25.6%
Notation Software Programs (Finale, Sibelius, Noteflight, etc)	53.2%
Smart Music	53.7%
Music Apps	17.6%
Amplification Devices speakers, microphones, instrument pick-ups, etc)	22.5%
Electric Instruments	22.2%
PowerPoint or Slideshow Presentations	52.3%

American strings and orchestra teachers did not report a high amount of training on a majority of the above digital technologies. They did, however, report receiving the most training for Smart Music, Notations software programs (Finale, Sibelius, Noteflight, etc.), and PowerPoint of slideshow presentations (listed in order of most to least training).

For the following table, teachers were asked to choose a favorite digital technology that they utilize in their classroom. This question was a free-response format and teachers could write down anything they wanted. I organized their responses into 15 categories, as seen below. Responses are listed in order of most to least favorite, using percentages.

**Table 4: Favorite Digital Technology**

<b>Type of Digital Technology</b>	<b>% American strings and orchestra teachers chose as his or her favorite</b>
Recording Device (Audio mainly, video)	27.168%
YouTube	17.341%
Smart music	13.295%
Notation Software	9.827%
iPad	8.671%
Smartboard	4.046%
Smart phone	4.046%
Recordings (CDs mainly)	2.890%
Projector/PowerPoint	2.890%
Music websites	2.312%
Electric instrument (keyboard, strings)	2.312%
Social media	1.734%
Music app	1.156%
Metronome	1.156%
Computer	1.156%

For the above data, the top three digital technologies that teachers ranked as their favorites include: Recording devices (mainly audio, but also video), YouTube, and Smart Music. Many teachers also included how recording devices were used for assessment in their classroom. Some explained how they would play back recordings of concerts or student playing exams to analyze the performance.

## **Chapter 5**

### **DISCUSSION AND CONCLUSION**

#### **Discussion**

Digital technology has permeated school systems throughout the United States. Many teachers have found digital technology to be effective and engaging, and choose to incorporate it into their classrooms. However, I do believe that *how* teachers are incorporating digital technology into their classrooms plays a huge role into its effectiveness. As technology continues to evolve, teachers need to keep educating themselves about different devices and programs to use in their classrooms. Some forms of digital technology are undoubtedly more useful and effective than others, but the more that educators can find out about ways to incorporate it, the more beneficial it will be for their students. Strings and orchestra classrooms, in particular, can greatly benefit from the inclusion of digital technology in the classroom.

#### **Comparisons to Other Research Studies**

Other research studies have examined the effectiveness of digital technology in music classrooms and also specifically in orchestra classrooms. Many studies support the data that I have found in my research through the online survey.

McKenzie's study on multiple intelligences parallels my research's findings on the most effective technologies. McKenzie describes that each category of intelligence, as determined by Gardner, can benefit from specific digital technology to enhance the

learning process. For example, the verbal learners can benefit from using keyboards, speech recognition devices, and word processors and visual learners can benefit from the use of overhead projectors, videos, and slideshows. The second most effective digital technology from my results was YouTube videos. Both learners could benefit from the use of YouTube videos because to access a video, you must use a keyboard, and the video would benefit the visual learner. The digital technologies that McKenzie lists are supported by many of the digital technologies found effective by American String teachers in my survey.

Other studies have shown that at risk students can benefit from using digital technology (Forest, 1995). According to a recent study, students were much more captivated and engaged and also improved scores. The technologies that my study found as most effective can reach out to at risk students and help to meet their needs.

Recording devices and YouTube videos, the top two most effective technologies, can help to draw in students with special needs. It can assist them in communicating and interacting more easily (Malawskey, 2012). When students are not able to effectively communicate what they want or like, sometimes looking at a video or listening to a recording device can help them point out what they like, and can engage them more.

Music websites are another form of digital technology found helpful in my survey. I have spoken with teachers who have said how helpful music websites have been for their students with special needs. An orchestra director explained how he had a violin student who could not grasp note reading and was struggling. He gave a music website to the parents for their child to review note reading in the format of a fun online game. The child absolutely loved the game and was much more engaged than he was in

class when the teacher was just pointing to notes and quizzing kids for the note names. Music websites can also help all types of learners and enhance the learning process. All students do not learn the same way. However, sometimes it is difficult for one teacher to teach a whole class of students that each learns in his or her own unique way. Digital technology can supplement their materials and can give students a way to practice or learn more outside of school as well. Moreover, some students have a difficult time focusing in the classroom, but at home, they could use digital technology to enhance the learning process without distractions.

In my survey, teachers overwhelmingly selected Recording Devices as their favorite digital technology device. SmartMusic is one type of recording device that students can use to play along with their music and see which notes and rhythms they are playing incorrectly. According to a recent study in University of Nebraska, SmartMusic greatly improved the note reading skills of students. Also, 94% of the students using the program in this study reported to practice “a little bit,” “sometimes” or “a fair amount” (SmartMusic). Recording devices allow students to hear themselves from a different point of view and evaluate themselves. Teachers have also used recording devices to record their ensembles, and listen to see what can be improved, and play back rehearsals to student to see what they think needs the most improvement.

In another study, the nine standards of Music Education were examined. The least favorable standards were examined and include composing and arranging music within specific guidelines, understanding relationships between music, the other arts, and disciplines outside the arts (Riley, p. 1). Music notation programs were used to help teach these standards and incorporate them more easily in the curriculum. According to

my survey, notation software was found to be 53.2% effective amongst American strings and orchestra teachers.

### **Conclusions**

Technology keeps evolving and teachers must learn to adapt to it. The results from the survey supported my hypothesis that digital technology in strings and orchestra classrooms proves as effective. However, teachers must align the digital technology that they decide to use with their classroom curriculum and be educated and trained in how to use it, or else it could take away from the learning experience.

If I were given the opportunity to conduct this survey again, I would like to expand upon the knowledge I have gained from this project. I would send a separate survey to students in strings and orchestra classrooms. While I believe the teachers gave good feedback, the opinions of the students are also very important. The teachers may think certain digital technologies are effective, but students may not agree and vice versa. I would also like to compare the answers of teachers and students about how engaging the digital technology is in the classroom.

I would also like to learn more about *why* certain digital technologies are more effective than others and which creative ways teachers have chosen to incorporate them into their classrooms. Instead of having multiple choice for teachers to select, I would have more free response questions so that teachers wouldn't be forced to select one answer choice.

It is my hope that more and more strings and orchestra teachers continue to include digital technology into their classrooms and keep finding unique ways to make students engaged and motivated to learn.

## Appendix A

### Questionnaire

#### **The Effectiveness of Digital Technology in K-12 Strings & Orchestra Classrooms**

Informed Consent Form for Social Science Research The Pennsylvania State University

Title of Project: The Effectiveness of Digital Technology in K-12 Strings Classrooms

Principal Investigator: Emma Ripp, Undergraduate Student (631) 804-7278

[ekr5038@psu.edu](mailto:ekr5038@psu.edu)

Advisor: Dr. Robert Gardner 210 Music Building I University Park, PA 16802 (814)

863-2367; [rdg13@psu.edu](mailto:rdg13@psu.edu)

1. Purpose of Study: The purpose of this study is to observe how current strings teachers in public schools are utilizing digital technology within their strings classrooms. My aim is to find if they are truly finding digital technology to be an effective teaching tool, and how their students respond. This study will also aim to show which specific digital technologies are most popular or preferred to current strings teachers.
2. Procedures to be followed: You will be asked to answer various questions about your experiences with digital technology within your strings classroom.
3. Duration: This survey will take up to 10 minutes.
4. Statement of Confidentiality: Your participation in this research is confidential. The data will be stored and secured in Survey Monkey servers in a password-protected file. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.
5. Right to Ask Questions: Please contact Emma Ripp at (631) 804-7278 with questions or concerns about this study.
6. Payment for Participation: Payment will not be offered for this study.
7. Voluntary Participation: Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer questions that you do not want to answer. You must be 18 years of age or older to take part in this research study. By continuing forward and completing the following survey, you are consenting to participate in this research study.

You may print this form for your records.

**\*1. Have you used any form of digital technology within your strings/orchestra classroom? (For example: a recording device, computer software, or an electric instrument)**

Yes

No

**\*2. How effective do you find the following digital technologies in helping students learn in your string/orchestra class(es)?**

	Not at all effective	Barely effective	Moderately effective	Effective	Very effective	N/A
Recording Devices	<input type="radio"/>					
YouTube Videos	<input type="radio"/>					
Smart Boards	<input type="radio"/>					
Music Websites	<input type="radio"/>					
Social Media (Facebook, Twitter, etc)	<input type="radio"/>					
Podcasts	<input type="radio"/>					
iPads	<input type="radio"/>					
Notation Software Programs (Finale, Sibelius, Noteflight, etc)	<input type="radio"/>					
Smart Music	<input type="radio"/>					
Music Apps	<input type="radio"/>					
Amplification Devices (speakers, microphones, instrument pick-ups, etc)	<input type="radio"/>					
Electric Instruments	<input type="radio"/>					
Powerpoint or Slideshow presentations	<input type="radio"/>					

Others (please specify)

**\*3. How proficient are you at using the following digital technologies in your strings/orchestra classroom?**

	Not at all proficient	Barely Proficient	Moderately proficient	Proficient	Very proficient	N/A
Recording Devices	<input type="radio"/>					
YouTube Videos	<input type="radio"/>					
Smart Boards	<input type="radio"/>					
Music Websites	<input type="radio"/>					
Social Media (Facebook, Twitter, etc)	<input type="radio"/>					
Podcasts	<input type="radio"/>					
iPads	<input type="radio"/>					
Notation Software Programs (Finale, Sibelius, Noteflight, etc)	<input type="radio"/>					
Smart Music	<input type="radio"/>					
Music Apps	<input type="radio"/>					
Amplification Devices (speakers, microphones, instrument pick-ups, etc)	<input type="radio"/>					
Electric Instruments	<input type="radio"/>					
Powerpoint or Slideshow presentations	<input type="radio"/>					

Other (please specify)

**\*4. Have you received any training (through school, an outside workshop, etc.) in the use of the following digital technologies?**

	Yes	No	N/A
Recording Devices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
YouTube Videos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smart Boards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Music Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Media (Facebook, Twitter, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Podcasts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iPads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Notation Software Programs (Finale, Sibelius, Noteflight, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smart Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Music Apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amplification Devices (speakers, microphones, instrument pick-ups, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electric Instruments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Powerpoint or Slideshow presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

**\*5. Which form of digital technology is your favorite to use and why?**

**\*6. In your opinion, how helpful has the incorporation of digital technology into your strings/orchestra classroom been for your students in the following ways?**

	Not at all helpful	Somewhat helpful	Moderately helpful	Extremely helpful
Tonal accuracy: Student is aware of pitch and fingerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intonation: How "in tune" fingers are	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rhythmic accuracy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consistency of pulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Musical expression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tone quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student Engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*7. In your opinion, how helpful has the incorporation of digital technology into your strings/orchestra classroom been for you as a teacher in the following ways?**

	Not at all helpful	Somewhat helpful	Moderately helpful	Extremely helpful
Classroom management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Formal and informal assessments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Presenting new materials or concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparation time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity for lessons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**8. Do you have finances available from the school for purchasing digital technology for your string/orchestra classrooms?**

Yes

No

**\*9. Do your administrators encourage the use of digital technology in your classrooms?**

Yes

No

**10. What state do you teach in currently?**

State:

**\*11. What is your gender?**

Female

Male

**\*12. Please check the grade levels of students in your string/orchestra classes (check all that apply):**

- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade
- 7th grade
- 8th grade
- 9th grade
- 10th grade
- 11th grade
- 12th grade

**\*13. Please select the following classes that you teach (check all that apply).**

- String/Orchestra classes
- Other music classes
- Non-music classes

**\*14. How many years have you taught music in the schools?**

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26+ years

**\*15. In what type of school(s) do you teach?** Public Private Charter Other (please specify)

Thank you for your participation in this project. Please click the done button to complete the survey.

## Appendix B

### Email Sent to ASTA Members

You received this email because you are an ASTA member who has self-identified as a K-12 strings/orchestra teacher. Don't forget to add [asta@astaweb.com](mailto:asta@astaweb.com) to your address book so we'll be sure to land in your inbox!

You may [unsubscribe](#) if you no longer wish to receive our emails.



## American String Teachers

### Association

**Are you a string teacher at the K-12 level? ASTA wants your opinion on the use of digital technology in the strings/orchestra classroom. Please take a few minutes to complete the following survey, being conducted by Penn State music education major Emma Ripp, who is sharing her research with ASTA.**

Hello! My name is Emma Ripp, and I am an honors student studying music education at Penn State University. I invite you to participate in a short survey (about 10 minutes) regarding your use of digital technology in the strings or orchestra classroom. Your participation is voluntary, and your responses will be kept completely confidential. To complete the survey, please click on the link below (or copy and paste it into your Web browser):

<http://www.surveymonkey.com/s/JNYSR66>

I appreciate your time and effort!

**REFERENCES**

- ABC News. (2010, January 20). *Study shows kids tethered to technology*. Retrieved from <http://abcnews.go.com/WN/kids-electronics-study-shows-kids-spend-hours-day/story?id=9616699>
- American string teachers association*. (2014). Retrieved from <http://www.astaweb.com/>
- Arostegui, J.L. (2010). Risks and promises of ICT for music education. *Hellenic Journal of Music, Education & Culture*, 1(1), 17-31. Retrieved from <http://search.proquest.com/docview/873379210?accountid=13158>
- Carruthers, G. (2009). Engaging music and media: Technology as a universal language. *Research and Issues in Music Education*, 7(1), 9-9. Retrieved from <http://search.proquest.com/docview/757172354?accountid=13158>
- Clark, S.A. (2003). *Instructional Technology, Motivation, Attitudes and Behaviors: An Investigation of At-Risk Learners in the Middle School General Music Classroom*. Boca Raton, FL: Universal-Publishers, 2003.
- Crawford, R. (2009). An Australian perspective: Technology in secondary school music. *Journal of Historical Research in Music Educatio*, 30(2), 147-167. Retrieved from <http://search.proquest.com/docview/753589515?accountid=13158>

- Criswell, C. (2009). Music technology: The computer in your student's pocket. *Teaching Music*, 17(2), 26-27. Retrieved from <http://search.proquest.com/docview/1522302?accountid=13158>
- Fedson, D. (2010). The teaching corner: There's an app for that! *The American Harp Journal*, 22(4), 68-69. Retrieved from <http://search.proquest.com/docview/857283319?accountid=13158>
- Forest, J. (1995). Music Technology Helps Students Succeed. *Music Educators Journal*, 81(5), 35.
- Helding, L. (2011). Mindful voice—digital natives and digital immigrants: Teaching and learning in the digital age. *Journal of Singing – the Official Journal of the National Association of Teachers Singing*, 68(2), 199-206. Retrieved from <http://search.proquest.com/docview/906923776?accountid=13158>
- Kertstetter, K. (2009). Educational applications of podcasting in the music classroom. *Music Educators Journal*, 95(4), 23-26. Retrieved from <http://search.proquest.com/docview/1110616?accountid=13158>
- Kuzmich, J. (2001). Contemporary string education: Modernizing string ensembles with electric pickups, electric instruments, MIDI synthesis, & published charts. *Jazz Educators Journal*, 34(1), 77-78, 80-81. Retrieved from <http://search.proquest.com/docview/1370731?accountid=13158>
- Kuzmich, J. (2012). New best practices with digital recording. *School Band and Orchestra*, 15, 36-37, 39-41. Retrieved from <http://search.proquest.com/docview/927879812?accountid=13158>

- Kuzmich, J., Jr. (2012), Technology: Using the iPad in music education. *School Band and Orchestra*, 15 42-46. Retrieved from <http://search.proquest.com/docview/1030388509?accountid=13158>
- Kuzmich, J. (2010), Using smart phones for music education. *Choral Director*, 7, 22-24. Retrieved <http://search.proquest.com/docview/845779189?accountid=13158>
- Levine, M. (2009), iPhoning it in. *Electronic Musician*, 25, 26-31. Retrieved from <http://search.proquest.com/docview/1400270?accountid=13158>
- Liu, T. C. (2007). Teaching in a wireless learning environment: A case study. *Educational Technology & Society*, 10 (1), 107-123.
- Malawskey, N. (2012, April 09). Technology can help special-needs children to communicate, play. *Penn Live*. Retrieved from <http://www.pennlive.com/midstate/index.ssf/2012/04>
- Mato, T. (n.d.). *Integrating technology in the music classroom*. (Master's thesis) Retrieved from <http://www.smcm.edu/educationstudies/pdf/rising-tide/volume-4/Takako-Mato-MRP.pdf>
- McKenzie, W. (2004). *Multiple intelligences and instructional technology*. Retrieved from <http://hpa.spps.org/uploads/MI.pdf>
- McKenzie, W. (2005). *Multiple intelligences and instructional technology*. Washington, D.C. ISTE.
- Morphew, V.N. (2012). A Constructivist Approach to the National Educational Standard for Teachers. International Society for Technology in Education. <http://www.iste.org/docs/excerpts/CONNEX-excerpt.pdf>

- National Association for Music Education. (2014). National Standards for Music Education. <http://musiced.nafme.org/resources/national-standards-for-music-education/>
- November, A. (2010). *Empowering students with technology*. Thousand Oaks, California: Corwin A SAGE Company. Retrieved from [http://books.google.com/books?hl=en&lr=&id=8qMbB2Nfxi4C&oi=fnd&pg=PR9&dq=empowering students with technology november&ots=LheK8AK6cc&sig=E9qMaDn9oWQMYdQCvEJVIm9TMWo](http://books.google.com/books?hl=en&lr=&id=8qMbB2Nfxi4C&oi=fnd&pg=PR9&dq=empowering+students+with+technology+november&ots=LheK8AK6cc&sig=E9qMaDn9oWQMYdQCvEJVIm9TMWo)
- Riley, P. (n.d.). *Pre-Service Music Educators' Perceptions of the National Standards for Music Education*. The University of Vermont. Retrieved from <http://www-usr.rider.edu/~vrme/v14n1/vision/Riley%20Final2.pdf>
- Rudolph, T.E. (2004). *Teaching music with technology*: Chicago. GIA Publication, INC.
- Savage, J. (2009). Book reviews: "computers in music education: Amplifying musicality," by Andrew R. brown. *British Journal of Music Education*, 26(3), 343-345. Retrieved from <http://search.proquest.com/docview/1326829?accountid=13158>
- (n.d.). SmartMusic: Research studies illustrate the value of smartmusic. *Smart Music*, Retrieved from <http://www.smartmusic.com/products/educators/administrators/research-studies/>
- Spanos, T., Hansen, C., & Daines, E. (2001). Integrating technology and classroom assessment.
- Welsh, S. (2012). The pros & cons of long-distance. *Strings*, 27, 61-62. Retrieved from <http://search.proquest.com/docview/1041304789?accountid=13158>

Wetzel, K. (1999). Getting in the technology game. *Learning and Leading with Technology*, 33-35. Retrieved from [www.iste.org/L&L](http://www.iste.org/L&L)

Williams, R. (2010). Long-distance learning: The benefits of internet video. *Strings*, 25, 55-56. Retrieved from <http://search.proquest.com/docview/821007996?accountid=13158>

# Academic Vita of Emma K. Ripp

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## EDUCATION

- The Pennsylvania State University**, University Park, PA May 2014  
*Bachelor of Music Education, Schreyer Honors College*  
Thesis Title: “The Effectiveness of Digital Technology in  
K-12 Strings and Orchestra Classrooms”
- Half Hollow Hills High School East**, Dix Hills, NY June 2010  
*Board of Regents Advanced Designation with Honors*
- 

## MUSIC-RELATED WORK EXPERIENCE

- Exeter Township School District**, Reading, PA Spring 2014  
*Student Teacher*
- Strings & Orchestra, grades 5-8
    - Focused on and improved technique, note reading abilities, ear training, posture, and musicianship
    - Implemented practice incentive program with original assessment and rubrics
    - Taught students with special needs and behavioral problems
  - Band, grade 8
    - Addressed and built upon skills for: rhythm, intonation, dynamics and air flow
    - Also taught students with special needs and behavioral problems
  - General Music, grade 7
    - Created original lesson plans and detailed PowerPoint presentations for 1.5 hour daily classes
    - Expanded students’ knowledge of significant Romantic composers and popular music
- Lenina Crowne**, State College, PA Spring 2013 – Spring 2013  
*Cellist in local indie-folk rock band*
- Experience improvising and performing popular musical styles
  - Performed approximately 2-3 gigs per week
- Private Cello & Piano Teacher** Fall 2009 – Spring 2013
- Experience teaching students 6-21
  - Prepared cello and piano students for solo competitions and solo recital
- Altoona Symphony**, Altoona, PA Fall 2012 – Summer 2013  
*Cellist*
- Jamaica Field Service Volunteer**, Boston Bay, Jamaica June 2013
- Taught music to ages 5-13 at rural, impoverished elementary school
  - Led classes in Afro-Caribbean drumming, authentic Jamaican folk songs, and basic recorder songs

## NON-MUSIC WORK EXPERIENCE

- Full-time Nanny** Summer 2013
- Taught piano and Spanish lesson daily
  - Prepared meals, provided transportation, maintained household routines, supervised enrichment homework, managed activities
- Law Office Secretary** Summer 2012
- Scanned case-file documents, organized client list, and answered phones
- Garwood's Restaurant & Pub** Summer 2008 – Summer 2011
- Busser and Food Preparer at upscale, lakefront restaurant

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## HONORS AND AWARDS

- Deans List, All Semesters 2010 – 2014
- Gerald Bayles Memorial Scholarship, Schreyer Honors College Fall 2010 – Spring 2014
- Music Achievement Scholarship, All Semesters Fall 2010 – Spring 2014
- Pi Kappa Lambda Music Honor Society Spring 2014
- HonorSociety.org Spring 2013 – Spring 2014
- Golden Key National Honor Society Fall 2012 – Spring 2014
- Pi Lambda Theta Honor Society Fall 2012 – Spring 2014
- Gerald Bayles Memorial Scholarship, Schreyer Honors College Fall 2010 – Spring 2014
- Music Achievement Scholarship, All Semesters Fall 2010 – Spring 2014
- Dorothy Hughes Young Endowed Scholarship, Music Education Spring 2013
- Schreyer Honors College Grant for Jamaica Field Service Spring 2013

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## PROFESSIONAL AFFILIATIONS

- **American String Teachers Association** September 2011 – Spring 2014
  - Treasurer September 2011 – September 2012
  - Vice President September 2012 – September 2013
  - Attended national conferences (2012, 2013, 2014)
- **Pennsylvania Music Educators Association** September 2010 – Spring 2014
  - Member
  - Attended state conferences (2011, 2012, 2013)

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## OTHER SKILLS

- **Spanish Language Proficiency**
  - Intermediate Speaker and Writer (9 years of experience)
- **Technology Skills**
  - Sibelius, Finale, Garage Band, MIDI Files, Music Apps, recording equipment
  - Word, Excel, PowerPoint