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Capstone Thesis

Lesley University

April 15, 2019

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Specialization: Music Therapy

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Abstract

The use of technology, specifically digital songwriting and music making, in the context of psychotherapy is a subject that is not yet as well researched or practiced in the field of music therapy. The majority of the existing literature acknowledges the assistive function that technology such as tablets, smartphones, and computers can play in treatment of populations with cognitive and motor difficulties. However, there is little regarding the use of technology as the main means of creating music, and even less in the context of treatment of psychiatric disorders in children and adolescents in family settings. For this capstone project, I explored three interventions using digital music making, including a warm up, main activity, and cooldown activity, with three youths and their families as part of their In Home Therapy treatment. Upon analysis of my reflections, I learned that it indeed possible to use electronic music technologies as a primary means for implementing music therapy interventions using digital music making in order to help clients work toward achieving their clinical goals. This capstone project adds to the existing literature and provides some examples of interventions using digital music making that may inspire future clinicians to continue the process of exploration and perhaps establish the use of electronic music technologies as a professional competency.

Keywords: technology; music therapy; digital music making; electronic music technologies; mental health counseling; family therapy; children; adolescents; youth; arts-based research

**Introduction**

Music technology has been an interest of mine since I first took a class in my undergraduate studies regarding electronic music composition. Since then, I have been building upon my skills, mostly by trial and error, in order to further my musical knowledge and as a hobby. In the past, I did not think that this hobby would play a role in my studies or my practice as a music therapist-in-training. However, as I continued to explore the topic, the more I realized that this was a valuable tool I could use clinically, especially when working with younger populations.

After entering graduate school for music therapy, I noticed that there was a distinct lack of knowledge amongst current clinicians and most of my classmates about the use of technology in music therapy when working with clients. To me, this is unfortunate, since so many adolescents and children that I work with at my internship site have grown up listening to more electronic sounding music (i.e. synthesized instruments in modern pop music, hip hop, electronic dance music [EDM], etc.). In addition, in my experience, many youths we are working with as clinicians tend to be excited at the premise of using technology in sessions, as it is something that is more familiar to them from a cultural perspective. As a field, I feel that music therapists should focus on learning more about and integrating the use of technology as a tool in music making when working with clients, alongside traditional acoustic instruments and methods. It is important that music therapists, especially younger clinicians, learn the specific skills and interventions that can be used with populations who may benefit from the use of technology.

My area of interest professionally is working with children and adolescents who are referred for mental health counseling due to mood and anxiety issues. At my internship, I work
in the home setting with clients and their families to increase emotional expression and facilitate better communication amongst all family members. Due to scarcity of acoustic instruments at my site, I frequently use technology to provide music psychotherapy with my clients. I have a strong interest in finding out more ways I can deliver my service using these tools. This paper will first present some of the research that exists regarding the use of technology in music therapy in addition to literature on how music therapy can be used within family settings to meet younger clients’ needs. Afterward, I will outline the methods for new interventions I explored for my capstone project and my reflections on this process, as well as implications for practice and potential avenues for further research.

**Literature Review**

As the use of technology in music therapy grows, so too will the breadth of research on the topic. At present, there is limited literature on the specific ways to implement technology as a tool in music therapy treatment, and even less on a theoretical approach that views digital instruments as a primary music making tool. Indeed, familiarity with digital music making is not currently considered a basic professional competency by the American Music Therapy Association (AMTA; American Music Therapy Association, 2019). Existing literature primarily focuses on using technology to facilitate music making as an alternative to traditional instruments where acoustic instruments may not be best suited for specific client populations, such as those with profound motor and/or intellectual difficulties (Magee & Burland, 2008). Clements-Cortes (2007) noted that electronic music technologies (EMTs) have been used in both individual and group settings with a wide variety of ages, functioning levels and therapeutic needs.

**Populations and Uses**
Literature on the use of technology in music therapy seems to be divided into two overarching categories: (a) technology as an adaptive instrument for those with physical limitations and developmental disabilities; and (b) technology for digital music making and creation with multiple populations, including those with psychiatric difficulties.

**Music therapy in those with cognitive and motor disabilities.** Technology can be used in music therapy with individuals with developmental, physical, and complex disabilities, especially those with severe cognitive and motor difficulties, as an adaptive tool or instrument (Clements-Cortes, 2007; Magee & Burland, 2008; Partesotti, Peñalba, & Manzolli, 2018). This includes computer-assisted music making, such as a Movement-to-Music system in which specific movements trigger notes or sounds to be played to provide audiovisual and haptic feedback within a music therapy session (Clements-Cortes, 2007; Partesotti et al., 2018). Other examples include various switch-activated devices that serve as adapted musical instruments (Clements-Cortes, 2007). In an exploratory study of the clinical uses of electronic music technologies, Magee & Burland (2008) found that nearly all six of the music therapists interviewed identified children and adolescents with profound motor and intellectual difficulties as a population where technology can be helpful in treatment.

**Music therapy in those with psychiatric needs.** Less information is available on the use of EMTs in music psychotherapy. This section first outlines support for music therapy practices in treatment of children, adolescents, and families with emotional and behavioral needs. It then reports on the current use of EMTs with these populations.

**Music therapy in clinical and family treatment.** Research has shown music therapy to be at least moderately effective overall in treating those with emotional and behavioral problems (Porter et al., 2017). In a randomized controlled study, Porter et al., (2017) studied the efficacy of
music therapy interventions in addition to regular treatment in the depression scores and self-esteem levels of 251 children aged 8-16 in six Child and Adolescent Mental Health Service community care facilities in Northern Ireland. Porter et al. found that results indicated the adjunct music therapy treatment contributed to lower depression scores and higher self-esteem levels at the end of 12 weeks of treatment, though these effects were not retained 13 weeks after end of treatment. However, Porter et al. did find that adjunct music therapy increased treatment compliance, leading researchers to conclude that music therapy is a “clinically attractive” treatment option for this population. In addition, Nemesh (2017) and Flower (2014) explored family-based music therapy practices and interventions to address mental health goals and the caregiver-child relationship in youths and their families. In an exploratory qualitative study, with the understanding that family musical improvisations “recreate and reflect existing family relationships, communication, and dynamics” (p. 171), Nemesh found that this type of music therapy intervention allow for the opportunity to safely explore individuality and self-expression for children, adolescents, and adults in the family context (p. 171). Similarly, in an exploratory qualitative study examining the role of participants in the caregiver-client-therapist relationship in family therapy, Flower found that the parent involvement in music therapy sessions with the child and therapist resulted in stronger parent-child relationships. It also facilitated greater communication by helping to repair bonds within family members. Flower also found that the parent was better able to fully realize her role in the relationship with her child within the music therapy session. The parent was also able to generalize this realization outside of session to deepen her understanding of herself within the caregiver-child relationship. Since my internship primarily employed treatment using the family therapy approach, it was important to keep this research in mind.
Electronic music technologies in music psychotherapy. Though information specifically on using EMTs as digital music making tools is scarce, there is some literature that discusses possible applications of technology in music psychotherapy. Interestingly, Magee & Burland (2008) found that the music therapists surveyed in the exploratory study did not recommend using EMTs with populations experiencing emotional disorders or difficulties associated with autism spectrum disorders, citing that these populations may not be able to handle fragile equipment. However, it is possible that at the time, the technology and knowledge of skills needed to facilitate sessions using EMTs may not have been adequate or available, as the usability of and knowledge about technology has improved significantly since then.

Clements-Cortes (2007) wrote that music therapists could use EMTs to distract clients from anxiety they may be experiencing, either by allowing clients to listen to pre-recorded music and relax or as a way for clients to use pre-recorded music to express themselves. Clements-Cortes also suggested that music therapists could help clients create recordings of original compositions on everyday devices (such as phones, computers, tablets) to facilitate client goals such as increasing self-expression and fostering a sense of achievement.

Viega (2014) wrote a personal reflection on listening to and creating what he called “ambient music” and its implications in the practice of music therapy. Overall, he described listening to ambient soundscape pieces as contributing to “peak music listening experiences”. In this article, Viega (2014) used a transpersonal approach with this technique in music therapy to provide a transformative process for the client who requires relaxation or processing of difficult emotions in a safe environment. His process and method of implementation is discussed later in this paper.
Viega (2016) described his process in Arts-Based Research regarding his experience in working with adolescents with psychiatric difficulties using digital music making in order to create a hip hop style music album representative of the adolescents’ journey through their struggles over the course of treatment. The artist statement and the accompanying video file discussed the author’s interpretation of the adolescents’ process in creating the album. Viega (2016) presented this interpretation by using digital samples of his clients’ work mixed along with his own musical input in his presentation. It was evident to me through the musical transformation in the songs that the author was reflecting on the therapeutic process, especially with adolescents. This was evident in his work by the hip hop sounds he used and the often times jarring sounds that can be associated with certain painful events in an adolescent’s coming of age story.

**Music Therapists’ Relationship to Technology**

At present, it is difficult to assess the music therapy community’s response to adopting EMTs as a part of treatment. The prevailing notion seems to be that EMTs are to be used in conjunction with acoustic instruments and only as a primary instrument in treatment if acoustic instruments are not enough to meet the client’s needs (Clements-Cortes, 2007). In a survey about music technology usage among approximately 600 practicing music therapists across Australia, the United States, and the United Kingdom, Hahna, Hadley, Miller, and Bonaventura (2012) examined how clinicians obtained training or knowledge of music technology as well as barriers to implementation of EMTs in treatment. After statistical analysis, the researchers found that although the majority of music therapists who responded were female and of an older generation, the best predictor for a clinician using technology was if they were male and in the 21-30 age range. Younger clinicians overall tended to hold a more favorable view of technology in music
therapy and had more training. Similarly, Knight (2013) noted that “as the next generation of clinicians enters the workforce, they bring with them a different kind of familiarity with technology” (p. 190), as they are more experimental, curious, and willing to explore using applications without fear of potential negative consequences (p. 190). However, this does not address the lack of formal education in EMTs for music therapists. Magee & Burland in 2008 remarked that clinicians feel that they do not have adequate formal training in this area of music therapy. In 2013, Knight observed that greater access to devices and applications did not correlate with greater understanding among music therapists on how to use EMTs in clinical contexts, even though there have been more continuing music therapy education workshops offered on EMTs. However, Crooke in 2018 suggested that overall, there is still limited knowledge in the music therapy community about the specific techniques involved in interventions using EMTs, especially with regard to digital music making.

A reason for this lack of knowledge about may be due to the lack of diversity overall in the music therapy community, both in terms of ethnicity and culture but also in terms of exposure to different types of music. In my experience, the vast majority of music therapists come from a predominantly White background, or are trained in a style of music that emphasizes acoustic instruments and Western chord progressions and tonalities. This is largely reflected in the AMTA professional competencies as well, which requires music therapists to demonstrate proficiency in only Western-based music theory, repertoire, and aural skills (American Music Therapy Association, 2019). Unfortunately, this practice excludes many potential music therapists who may come from cultures which do not view music through the same lens. Indeed, there is no mention of familiarity with genres other than “traditional, folk, and popular songs” listed in the AMTA professional competencies, which unfortunately dismisses the contribution
of hip hop, rap, and electronic music that is prevalent in our culture today. Additionally, the majority of music therapists currently practicing in North America are female as noted by Hahna et al. (2012). Since technology has been historically associated with male-dominated science, technology, engineering and mathematics (STEM) fields of study, the music therapy field as a whole may have an implicit bias against those incorporating digital methods of creating music. Unfortunately, all of this contributes to a lack of music therapists from diverse backgrounds who would be willing to use different styles of music in their practice.

I also briefly want to touch upon some personal experience I have had regarding this topic. This past October, I had the opportunity to present with a classmate about the specific skills that music therapists who are new to the world of music technology could begin to use in their sessions, requiring nothing more than a computer with internet access, or an iPhone/iPad. In researching to prepare for the presentation, I was disappointed to find that there were not many resources available addressing how specific skills used in applications like GarageBand or on websites like SoundTrap.com could be used in music therapy. As a result, my classmate and I had to depend largely on our own past experiences, outside of our formal music therapy training, in order to discuss possible interventions that can be used with the iPad/iPhone or other systems. The feedback that we received from presentation attendees also seemed to suggest that this was a gap in education for many music therapy programs.

What is the reason behind this seeming resistance to embracing EMTs in treatment? Some of the hesitation may stem from difficulty in developing a theoretical framework that incorporates the use of machines into our work. In some ways, we must shift our understanding of technology as it becomes increasingly integrated into our everyday experience: technology is not merely an object or a tool, but rather it is something with which we experience a relationship
between two entities, the human and the computer (Magee, 2018). Partesotti et al. (2018) observed that the bodily and mental experience of music can be extended using technological instruments. Magee (2018) stated that as music therapists, we have to ask ourselves how can music technology still enable meaningful participation? How can we retain our identity as music therapists when digital instruments or tools are used?

**Digital Music Making as a New Tool for Music Therapists**

While much of the currently available literature on the topic of electronic music technologies focused on the assistive function of technology in music therapy, Crooke (2018) explored using EMTs as means of digital music making. Crooke briefly discussed the history of electronic music, including the African influence of beatmaking in hip hop’s roots in the 1970s and 1980s. The article continued in describing how hip hop beats and electronic dance music can be created from a drum machine or beat sequencer, along with synthesizers, to quickly and easily form the structure of a song digitally, blurring the lines between musical instrument and machine. Crooke also described using synthesized instruments to create rich esoteric soundscapes. All of these functions can be accessed with the GarageBand application either for macOS or iOS, though other entry level digital audio workstations (DAWs) also exist Crooke (2018). However, according to Crooke, in order to have more use of this platform, the perception among music therapists, musicians, and possibly clients that electronic music is a “lesser form of music making” needs to change.

Knight (2013) specifically examined the use of the iPad and other applications (‘apps’) available for iOS in music therapy. Knight provided helpful lists of apps that are: (a) to be used as digital music making instruments, including digital equivalents of keyboards, beat sequencers, guitar, and percussion; (b) to be used for playback of pre-recorded music; (c) to be used for
recording live or app-based music, including the use of the iRig device to input live electronic instruments (i.e. keyboard, electric guitar, etc.) directly into the iPad for recording. Overall, Knight supported the multipurpose use of the iPad, and advocated for changing the language among clinicians from “using” iPads in treatment to “integrating” iPads as a regular part of treatment.

As previously alluded to, Viega (2014) used digital music making as way to induce a meditative state using ambient music soundscapes. Viega (2014) noted that in order to be considered ambient music, it must follow the following 7 key components, as originally outlined by Brian Eno on his 1978 ambient piece *Music for Airports*:

1. Ambient Music focuses on texture of sound as the primary compositional attention.
2. Ambient Music makes use of electronics to create acoustic spaces that do not exist in nature.
3. Ambient Music allows for the listener to be immersed in sonic worlds.
4. Ambient Music enhances environmental acoustic and atmospheric idiosyncrasies.
5. Ambient Music contains mood and emotion.
6. Ambient Music is intended to create a space for thinking and calm.
7. Ambient Music must be able to accommodate many levels of listening attention without enforcing one in particular; its music be as ignorable as it is interesting.


Viega (2014) wrote that experiencing ambient music evoked a state of “creative listening”, in which the listener is attuned to the ambiance of their existence and can “nomadically travel to
“various worlds” in an altered state while still “being fully present to the constant changes that make life worth living and attending to” within the session (Listening and Creating in Music Therapy section, para. 2). In this style of music therapy, the music therapist must be highly attentive to the client in order to change the music (whether improvised or pre-recorded) to match the client’s needs. For example, if the soundscape brings up uncomfortable emotions or sensations for the client, they must be able to identify this and make a change to facilitate greater relaxation or process through the difficult emotions (Viega, 2014). In essence, the music therapist uses a transpersonal and client-centered approach by altering specific musical elements in ambient music to produce a transformative experience for the client. This involves exploring the qualities of sounds rather than musical structural elements, such as attack, sustain, cutoff, resonance, and waveform (Viega, 2014, Creative Methods of Music Therapy section, para. 1). These qualities may be difficult or impossible to generate and control with traditional instruments, but are readily apparent in digital music making applications like GarageBand for iOS, in order to synthesize an appropriate soundscape.

Benefits and Drawbacks of Electronic Music Technologies in Music Therapy

Like all other tools in music therapy, there are benefits and drawbacks to using electronic music technologies in practice.

Benefits of EMTs. Clements-Cortes (2007) identified several strengths of including the use of EMTs in the practice of music therapy. For one, the programs and applications available are fairly easy to use, resulting in less stress for clients, especially since many populations today are already familiar with technologies (i.e. smartphones, tablets) and since applications are available at a fairly low cost (Clements-Cortes, 2007). EMTs also offer different styles of music for digital music making than are available with an acoustic instrument such as guitar or piano,
especially since electronic instruments can create sounds that are not available with traditional instruments (Clements-Cortes, 2007; Viega, 2014). EMTs include the possibility of using drum machines, beat sequencers and synthesizers. This creates a wide range of sounds applicable to a variety of different genres, allowing for more chances for the music therapist to find an appropriate sound to match the client’s musical preference (Crooke, 2018; Knight, 2013; Partesotti et al., 2018). Another key strength of using EMTs for digital music making is that it offers a way for clients who may not be as familiar with basic musical knowledge to interact directly with the music and the therapist (Partesotti et al., 2018). The client does not have to worry about the musical quality (i.e. anxiety surrounding not being a ‘real musician’), resulting in creating space for the music therapist and client to take a more process-oriented approach in therapy (Clements-Cortes, 2007; Partesotti et al., 2018). Because of this, EMTs can offer a greater appeal to some clients, especially younger populations (Crooke, 2018; Knight, 2013).

**Drawbacks of EMTs.** Using EMTs in treatment is of course not without some drawbacks and limitations. According to Clements-Cortes (2007), some clinicians and clients may view the digital music making interface as a barrier between the client and clinician. Clements-Cortes also states there is also a fairly high initial cost in investing in a tablet and other accessories or additional hardware. The perception of the high cost of a tablet could also negatively affect the therapist-client relationship when working with populations who may not have access to these devices (Clements-Cortes, 2007). There is also the threat of possible security breaches when using an internet connected device such as the iPad, and storing client data on cloud services (Knight, 2013). Lastly, and perhaps most importantly, music therapists today often report that they simply do not have the skills, knowledge, or resources for how to use
EMTs in practice, whether it be because of limited training opportunities, lack of time to learn new skills, or financial concerns (Clements-Cortes, 2007; Hahna et al., 2012).

**Method**

Originally, I had envisioned this capstone project to be a collection of multiple music therapy interventions, including several warm up, main, and cooldown activities, each utilizing technology in some way. This was intended as a guide for clinicians unfamiliar with the use of technology in music therapy, so that they could conceptualize and incorporate these skills into their practice. However, I quickly realized that such an undertaking would be too massive for the scope of this project. Therefore, for this capstone project, I instead only focused on the creation, implementation, and evaluation of one warm up activity, one main activity, and one cooldown activity.

**Participants**

My second-year internship site was at an agency which provides In Home Therapy, In Home Behavioral Services, and outpatient therapy for lower income children, adolescents and their families. My role at this agency was as a clinical intern for In Home Therapy, providing intensive, family-focused therapy and some treatment coordination to these populations. Although each client’s presenting problems were vastly different, each had a *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013) diagnosis which significantly interfered with their functioning in the school, home, and/or community settings. With permission from my site supervisor, I selected three
individuals\(^1\) who I felt would benefit from the addition of music therapy and expressive techniques to the usual treatment approaches.

The first participant was a 12-year-old boy, Charles, whose primary diagnoses were Obsessive Compulsive Disorder (OCD) and Attention Deficit Hyperactivity Disorder (ADHD). Charles had difficulty with sustaining his attention and controlling impulsivity in his actions and speech, in addition to fixating on thoughts and compulsions associated with touching certain physical items, fear of germs, and fear of being alone. This was causing a significant amount of stress in the family, especially since he could not communicate his needs effectively with his mother and his sister, leading to frequent arguments. The second participant, Eva, was a 17-year-old girl who was struggling from effects of Post-Traumatic Stress Disorder (PTSD) caused from repeated sexual abuse by her father from age 10 to age 14, as well as from losing the criminal case against her father. Eva needed help developing coping skills to deal with depression and anxiety due to the trauma, as well as better ways for her and her mother to communicate more effectively and process the trauma. The last participant was Anna, a 13-year-old girl whose primary diagnosis was Generalized Anxiety Disorder (GAD). Anna’s main struggles revolved around her anxiety over going to school, often resulting in school refusal and emotional outbursts which disrupted both her academic standing and family functioning.

**Materials**

As someone interning in a non-modality site, I could only use materials I already owned or could purchase on a budget. The main items I used for sessions with my clients to implement the method were my iPad and Bluetooth speaker, along with the pre-installed music creation software GarageBand for iOS. This was most convenient for me as I already owned them and

\(^1\) Names are changed to protect client privacy.
had familiarity with Apple products. I found that having a pen and paper was useful for planning the songwriting with clients. Lastly, I had various art supplies on hand, though these were used for the warm up and cooldown activities. These art supplies included: oil pastels, chalk pastels, charcoals, markers, watercolors, drawing paper, watercolor paper.

For the arts-based research component of this capstone project, I made use of the art supplies I had, along with electronic keyboard, and GarageBand for iOS on my iPad and GarageBand for macOS on my MacBook.

**Design**

I designed this project to evaluate the implementation of the three interventions through a qualitative lens, relying on the arts to further process the effectiveness of the interventions. I decided to create a series of case vignettes in which I would analyze my own responses to determine success of the intervention. In order to operationalize what ‘successful’ meant, and to guide my observations, I created a template of questions to reflect upon after each session:

- Date of session and client info
- A brief description of the intervention as it happened in the session
- Questions:
  - Did the client like the activity?
  - Was the client engaged?
  - Did the activity accomplish the identified goal?
  - What was the caregiver’s response?
  - What are my own feelings?

After briefly journaling my responses to these questions, I also did an artistic representation of the intervention, either through visual arts, music, or both. I repeated this process using the same
interventions with different clients and different sessions with those clients, in order to allow for time to refine the interventions themselves to best suit the clients’ needs.

Procedure

This section is divided into the directive given to the client and the ways I reflected on the interventions after the session and as a whole.

Directives given to clients. As previously mentioned, I examined the effectiveness of three separate interventions: a warm up activity, main activity, and cooldown activity. Although I was mostly interested in the effectiveness of the main activity, digital songwriting, I felt as though it was important to also include some ways to use technology to both start and end the sessions.

Warm up: creating a soundscape with the Cove app. For the warm up activity, the client was given the directive to reflect on their feelings at that moment. The Cove app (Humane Engineering Ltd., 2017) provides an interesting way to check in with the client in that it guides them through identifying their current mood through choosing buttons that display various feelings such as: happy, sad, overwhelmed, lost, weak, grateful, lonely, angry, etc. The client can choose more than one mood on this page. On the next page, I helped the client choose a suitable preset soundscape background that matched their mood. The next section allows the client to choose a visual and musical representation of base [sic], melody, and percussion elements that they can add to create a fuller soundscape. I allowed the client to either continue reflecting on their mood at the beginning of the activity, or assisted them in organically developing the soundscape of their choice. In the last section, the app then allows the client to reflect upon that experience, giving the soundscape a name, and description. The app also presents buttons with
feelings again to see if there have been any changes in mood. The user is then able to save the soundscape as a digital and musical journal entry.

Although this activity is largely client driven, upon completion, the client and I verbally processed how that activity was for them, which usually allowed the client to start talking about their emotional and mental state and transition to a main activity. This activity also allowed the client to share more information about where they were at emotionally with their parent, if the parent was also present in the session.

**Main activity: Digital songwriting with GarageBand.** The purpose of the main activity was to facilitate emotional expression and communication between client and other family members. This activity included composing a song digitally through the use of the GarageBand app on my iPad. The main format of this activity is fairly simple, and analogous to acoustic methods of song writing, though it allows for flexibility to fit client desires and needs. Because the majority of the work is done on the iPad, it is also a very portable way of delivering music therapy, especially for in-home settings where access to a wide variety of instruments and/or a full recording studio may be impossible.

**Overall process.** To begin, I opened a new file under live loops in GarageBand for iOS. I had the client write down or verbalize their thoughts, feelings, and/or behaviors that relate to their problem area (e.g. OCD, PTSD, depression, anxiety) or a specific situation they wanted to create a song about, for example specific classes in their school day or how their day has been going. I then had the client reflect on those thoughts, feelings, and behaviors briefly, as much as they could without being overwhelmed and taking breaks as necessary. I directed the client to focus on one aspect they wanted to explore through the music (for example, a specific source of anxiety, a class in school, a specific time of the day), and invited them to explore live loops that
were preprogrammed by Apple on the iPad. Clients previewed the loops and selected whichever ones they felt were appropriate and layered them on the GarageBand interface until they were satisfied with the music segment that was created. I checked in with the clients frequently, making suggestions for instrument choices as necessary or to guide the client to remain on task. This process was repeated for other aspects the client wanted to explore musically until the client felt as though they were able to adequately represent themselves through the music. At this point, the client would play through each musical segment and the client, parent, and I would verbally process about how the musical qualities related to the subject matter at hand, and reflect how it made the client feel to listen to the segment. This process could take place over one session or several sessions, depending on the needs of the client.

*Additional optional steps*. At times clients may want to add original content in addition to the premade Apple content. If client and MT feel comfortable, client can create his/her own loops using other ‘smart instruments’ on the iPad and integrate them into their song. If the client wanted to create a melody or vocal line, they could do that as well, based on previously brainstormed thoughts, feelings and behaviors or original song lyrics. Finally, if the client wanted to have a copy of the song, the music therapist could arrange the loops digitally into a song format, either on GarageBand for iOS or importing it to a Mac interface. Through this, the music therapist can master the song digitally and give a copy to the client.

*Cooldown activity: drawing to music with GarageBand*. The cooldown activity was designed to purposefully be less structured than the warm up and cooldown activities. This cooldown activity was intended as a receptive music therapy relaxation activity to allow the client and parent, if present, reflect upon the session as a whole, before transitioning from the therapeutic space to resume daily activities. For this activity, I provided the client with a
selection of art materials, including watercolors, oil pastels, chalk pastels, markers, color pencils, and charcoals. This wide selection may overwhelm some clients, so I usually limited the selection to one or two materials. The directive for the client and parent was to listen to the improvised music I was playing using the GarageBand app and reflect on the theme of relaxation through art. Clients could draw, write words, explore with color, or simply take in the music. Overall, this activity promoted mindfulness and a chance to synthesize the session.

This activity involving using GarageBand on my iPad. Specifically, I navigated to the on-screen keyboard instrument. I checked with the client and parent to choose keyboard sound that both felt comfortable listening to while they drew or otherwise interacted with the music. This can include digital equivalents of acoustic instruments (piano, guitar, orchestral instruments), or synths. I checked with the client and parent for an approximate tempo for improvising music. There is also an option on GarageBand to improvise using ‘chord strips’, which are bars that play musical chords when touched, which can be programmed to ‘autoplay’. These chord strips, when played with certain synths, could also generate rich soundscape-like musical textures. As the music therapist, I was attentive to the responses of the client and parent, and made changes to the music I was playing accordingly.

My reflection process. After each session, I made some quick notes to help me remember the session or activity, following the template of questions I mentioned previously. Afterwards, I would review these notes and process them through artistic means, whether it be through music or visual art or both. At the end of the evaluation process, I organized my notes and artistic representations according to the activity chronologically. I analyzed each of these to find any patterns in changes that were made along the way to improve the interventions and
individualize them to client needs. Finally, I created a song to capture my journey throughout the process of exploring my method and writing the capstone project.

**Results**

This section contains some of the artwork that I created in my investigation of the process of learning how to incorporate technology into music psychotherapy sessions with children and adolescents and families.

Figure 1 and 2 are drawings I made in response to the cooldown intervention that I did with Charles, his mom, and his sister on two occasions.

![Figure 1: Holding Space by S. Kavety (oil pastel). (February 2019).](image)

For Figure 1, Charles, his sister, and his mom used watercolors to reflect upon the theme of “zen” chosen by Charles. The music I improvised created a rich synthesized soundscape. The music allowed the family to have space to explore their feelings about the session while also successfully promoting relaxation. The intervention seemed successful. My artwork seems to reflect this in that there is a sense of order, with colors and soft lines that give me the sense of comfort and safety.
In Figure 2, Charles and his sister sat together with mom watching but not participating. Although both children were listening to the same music focusing on “fun”, their drawings and behaviors seemed very different, with Charles remaining very active while his sister focused on completing the task and trying to ignore her brother. The intervention did not seem to accomplish its goals this time. The drawing seems to reflect the very different outcomes, with one half almost forming a serene nighttime scene while the other seems like a precariously placed object on the brink of falling. There is also a dividing barrier. The colors are very vivid and saturated, reminiscent of my experience of the intervention.

Figure 3 is a painting in response to the main activity with Eva. During the session, Eva was able to use the loops to create a composition representing her week, from feeling vulnerable and confused to
firmer and more controlled. The paint seems to reflect this with the colors becoming a bit more defined and saturated towards the right side. The arrows provide a sense of continual motion. This seemed to be a fairly successful intervention during that session.

![Image](image.png)

Figure 4: Hidden Spikes by S. Kavety (watercolor and oil pastel). (February 2019).

Figure 4 is a painting in response to the main activity with Charles. During this activity, Charles was reflecting on his feelings toward himself and his week. Over the course of completing the activity, Charles’ musical style shifted from being light and animated to darker and more “angry” sounding. Accompanying this, Charles mentioned that he had been having a progressively worse time with handling his sister’s teasing of him. Charles required a lot of redirection by the end of the activity to remain on task. This drawing seems to represent the activity fairly well. The black line gets more jagged and erratic and downward from left to right as the white lines seem to pop up out of nowhere more frequently and randomly (representing the discussion of issues with his sister). The activity was a success overall, though Charles required a lot of support in order to remain on task.
Figure 5 is an oil pastel drawing in response to both the warm up and cooldown activity with Anna and her mom. During the session, Anna was extremely happy and active the entire time. Anna talked a lot and seemed full of energy. Anna completed the Cove activity and was really excited about her finished product. During the cooldown activity, the theme was relaxation, and Anna and mom were able to fully participate in using oil pastels, and she was very happy to explain her drawing. I considered these activities to be a success as Anna was able to regulate herself throughout the session and communicate better than usual with me and mom. The bright colors and starburst patterns in my drawing seem to reflect this session accurately.

Figure 6 is an oil pastel drawing in response to the main activity with Charles. In this session, Charles reflected on how it felt to be angry. During this session, Charles’ focus was entirely on the
activity at hand, and he verbalized what he was feeling as “rage” and “fiery”. The artwork seems to reflect this, in that the black, orange, red, and grey colors seem to represent the intensity of an angry fire. The green and blue blocks around the ball of fire and smoke represent the loops in GarageBand being in disarray. It seems to me as though the activity was successful overall in this session.

![Image](image_url)

**Figure 7 Changes by S. Kavety (watercolor and oil pastel). (March 2019).**

Figure 7 is a painting in response to the main activity with Anna and her mom. During the session, Anna and her mom reflected on stages of treatment as I prepared to terminate with the family. The family was able to create three separate soundscapes to represent the beginning, middle, and ending of therapy over time. The activity was very successful in this session, as it allowed to both verbal and musical processing, with high levels of engagement from Anna and her mom. The drawing seems to reflect this process well. Looking at the artwork gives me a sense of happiness and wonder. Additionally, I created my interpretation of these soundscapes in song form (see additional files for “Reflection on Treatment”).
Figure 8 is a painting in response to the cooldown activity with Eva and her mom. In this session, Eva and her mom were given watercolors and asked to reflect on their current state of mind. Eva was feeling a lot of different and overwhelming emotions while her mom seemed to be cool on the surface but stressed underneath. The activity was successful because by the end of the session, Eva and her mom both seemed to come to an understanding about one another and were able to open up more to each other. Both reported feeling better after completing the activity. The artwork I made seems to represent my observations of the activity. The different intersecting colors on one side contrasts with the surface level order and serenity present on the other side, with a hard line dividing both. The water swirls represent the music as a way to connect both Eva and mom and break through the barrier holding them apart.

One of the main observations I have made is that the quality of the interventions I deliver depends greatly on my relationship with the client and family as well as my familiarity with the intervention over time. I also noticed that due to the very different presentations of each of my participants, the activities had to be adapted to suit their needs and treatment goals. Overall, these interventions have felt as though they have been successful and flexible enough to address different client presentations and needs during the sessions.

My artwork seems to have similar themes across each instance of the activity. The cooldown activity art seems to show connection, whether it be between family members or between my improvised
music and the client and family members. The art representing the main activity seems to have a lot of expressive content overall, eliciting strong emotions. It also displays the theme of change over time as evidenced by differences in color or style from left to right.

Lastly, I reflected on the process as a whole by creating a song to represent my journey in researching, experimenting with the interventions, and writing this capstone project (see additional files for “Reflection on Research”). Upon hearing the recording, the listener can sense my own subjective feelings throughout each stage of the process.

Discussion

At the outset of this project, I wanted to create a set of interventions that clinicians can use to incorporate the use of technology into music therapy sessions. During the first half of my internship, I was able to try out several different uses of technology in my counseling sessions with children and adolescents, mostly precipitated by the lack of instruments available to me at my site. As time went on, I realized that the scope of this capstone project did not allow for a handbook of interventions using technology in music psychotherapy as I had envisioned. I chose to focus on only three interventions: a warm up using an app to check in with the client; a main activity to create meaning of internal states or external events, through sound and music with digital songwriting; and lastly a cooldown activity to act as a relaxation and transition activity. These interventions all seemed to be very successful, and it was surprisingly easy to integrate electronic music technologies and digital music making into my sessions once I became more familiar with how certain musical or sound elements could be used. Through this project, I learned that digital music making uses the same music therapy skill sets I use with acoustic instruments. The most difficult part of this project for me was translating the therapeutic clinical musicianship skills and techniques I had already learned on acoustic instruments to digital tools. Overall, it was interesting to explore different uses of EMTs in music psychotherapy treatment.

My project seemed to confirm other articles that stated that EMTs could be used alone as part of interventions to address client goals in mental health treatment with youth and families. The children and families I worked with were very accepting of the use of technology in treatment, finding it approachable,
fun and different from usual talk therapy or music therapy interventions they had experienced in the past. This supports the claim that using EMTs may be a less stressful experience for clients who have not had exposure to music therapy in the past, as they are more familiar with the digital environment (Clements-Cortes, 2007). I did not feel as though the iPad was a barrier in my treatment, as Clements-Cortes (2007), Magee (2018), and Magee & Burland (2008) caution, however. If anything, utilizing the iPad as a part of treatment was helpful in connecting with my clients and their families.

Over the course of my project, I ended up utilizing many of the skills and techniques highlighted by Crooke (2018), Knight (2013), and Viega (2014), including using a drum machine and beat sequencer, digital instruments, and synthesizers to create soundscapes. In particular, my cooldown activity relied heavily on techniques outlined by Viega (2014) with using digital instruments to create soundscapes and facilitate listening in the “ambient mode” for relaxation and transformation. Not surprisingly, I had to rely on my own exploration of the iPad to guide the creation of the interventions I have presented here and others I have developed. This supports the observations of several studies that state that there is a lack of specific training in how to use EMTs in music therapy practice (Clements-Cortes, 2007; Crooke, 2018; Hahna et al., 2012; Knight, 2013; Magee & Burland, 2008).

Lastly, I was able to utilize EMTs within a family therapy approach to my treatment, something which has not been well researched. I felt that I was able to structure my interventions such that the client, sibling, and caregiver were able to express themselves safely, as Nemesh (2017) found. I also found that involving the parent in the therapy increased the family’s treatment compliance and provided an opportunity to begin to repair the child-caregiver or child-sibling bonds, supporting Flower’s (2014) observations. It was interesting to see family dynamics play into each family member’s relationship to the music.

Conclusions

This capstone project taught me a lot about how to create specific interventions using digital music making as the main means of music psychotherapy treatment with children, adolescents, and their families. I found that it required a shift in thinking in order to find clinical musicianship elements that
could be expanded to digital instruments. The Cove app turned out to be a very useful self-contained app for checking in with clients as a warm up activity. I was able to find clinical uses for sequencing Apple Loops into compositions with my clients. Lastly, I was able to use some elements of “creative listening in the ambient mode” to create rich soundscapes for relaxation during my cooldown activity (Viega, 2014).

There are of course several limitations to the conclusions of this capstone project. For one, although all of my clients qualified for Medicaid, they still had access to iPads, smartphones, and computers in their daily lives. Another limitation is that the three clients I presented in this project are all white Americans and have had exposure to electronically composed music in the past, with similar tonalities to the sounds present in GarageBand’s existing sound library. It is not certain whether my results could generalize to other cultures at this time. It is also very possible that my own background in music and familiarity with electronic composition affected my ability to use the GarageBand interface successfully and create clinical interventions based on my pre-existing knowledge of general concepts.

My hope is that this work will contribute to further exploration of the use of technology and digital music making in music therapy in the future. More research needs to be done in order to create a viable training program for using electronic music technologies as more than just for their adaptive functionalities but rather as digital music making instruments in their own right.
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**THESIS APPROVAL FORM**

Lesley University  
Graduate School of Arts & Social Sciences  
Expressive Therapies Division  
Master of Arts in Clinical Mental Health Counseling: Music Therapy, MA

Student’s Name: Sangeetha Kavety

Type of Project: Thesis

Title: Digital Music Making: Developing a Method for Using Technology in Music Psychotherapy

Date of Graduation: May 18, 2019

In the judgment of the following signatory this thesis meets the academic standards that have been established for the above degree.

Thesis Advisor: Vivien Marcow Speiser