Improving Virtual Music Education and Interaction Methods at Crocodile River Music

MAY 11, 2021

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Improving Virtual Music Education and Interaction Methods

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Submitted to
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Abstract

The musicians and artists of Crocodile River Music (CRM) have struggled to share their work in the arts, dance, and music of West Africa in the wake of the COVID-19 pandemic. Our team explored ways for them to sustain their audience using virtual and other novel modes of programming. Through interviews and surveys with the artists and audiences, we assessed best practices and audience preferences for creating online content, and provided recommendations for their production process, product offerings, and promotion strategies.

Executive Summary

Introduction

Crocodile River Music (CRM) is an education, outreach, and performance-based association of musicians located in the city of Worcester, Massachusetts. The organization promotes African music and culture in the region.

The goal of this project was to help Crocodile River Music become more prepared by exploring ways for them to reach their audience through virtual and other sustainable modes of programming. In order to meet this goal, we identified the following objectives: 1. compare and contrast platforms and equipment for at-home production; 2. understand audience and artists' preferences for engagement;

Figure E.1: Crocodile River Music logo

and 3. evaluate areas of growth and development for CRM's online presence. Meeting our goal meant providing recommendations to Crocodile River Music that had the potential to provide a secure future for the artists and their work.

Background

The COVID-19 pandemic had a major effect across the global economy, including the live music industry. Beginning in February and March of 2020, regions in the U.S. most affected by the pandemic began to enforce lockdowns. The implications for the live music industry were devastating. The live music industry saw a loss of 9.7 billion dollars in the year 2020 in just the United States alone (Fekadu, 2020). With such a big disruption in the industry, it is not surprising that the unemployment rate for the arts, entertainment, and recreation category in 2020 stood at 17% (Woods, 2021). The National Independent Venue Association conducted a survey in 2020 that found that 90% of independent venues in the United States expected to close permanently (Pasbani, 2020). This shocking figure shows how even after lockdowns, many artists would be left without venues in which to perform. Furthermore, even if there are venues open, many audiences will be hesitant to return to live music concerts even after restrictions are eased (Primov-Fever et al., 2020). Looking forward, this is a serious concern for musicians since live performances can constitute up to 75% of their income (Pasbani, 2020). The outcome is extremely problematic and leaves those in the music industry in a vulnerable position.

The opportunities for reproducing live performances in digital educational and artistic spaces are enormous. The development of video sharing platforms has enabled musicians to share music and connect with audiences around the world. This has revolutionized the music industry and allowed independent artists to promote their music to a wider and even global audience. Since the start of the pandemic, musicians have had to rely on these video sharing platforms and their fans in order to generate income (Riemenschneider, 2020; Vnukowski, 2020). No single platform offers all the functions needed to promote content, live stream concerts, and make a profit. For Crocodile River Music, a combination of a video sharing platform, live streaming platform, and monetized platform will be needed to meet all of their needs.

Results

Through our interviews, we learned that there are numerous pieces of equipment that go into producing virtual musical content, including microphones, cameras, mixers, lighting, soundproofing, and other elements. Experts identified equipment and techniques that worked well in their own experiences across a range of applications.
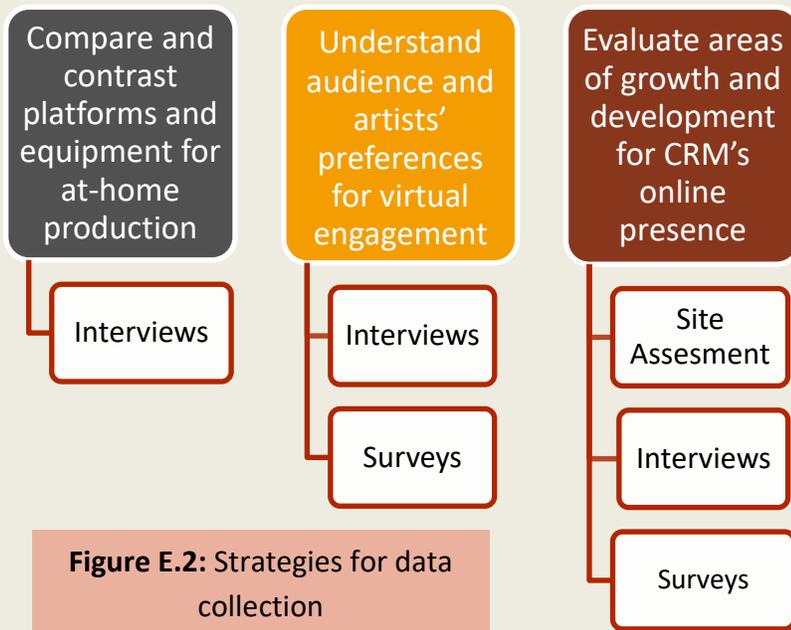
Many of the musicians interviewed did not pursue live streamed concerts and focused more on education and teaching. The challenges associated with virtual education seem to focus on the task of engaging with students, including making it fun, unique, interactive, and engaging.

The preferred method of watching music videos also varied. The top choices, according to our survey, ranked in order were YouTube, Instagram, TikTok, Facebook, and Vimeo. With 88% of respondents

Figure E.2: Strategies for data collection

ranking YouTube first, it was important to note that if they are going to YouTube to watch videos, it means that other social media platforms can be used to funnel viewers to a curated YouTube channel.

Discussions with members of CRM revealed that most were willing to contribute to content for online use, even once in-person performances are a possibility again. The musicians see online production as a way to reach students anywhere in the world; the possibility of an online program removes the

difficulty and expense of traveling. We learned that it takes about eight hours of work to produce one five-minute video (Participants 1 & 2, personal communication, April 16, 2021).

Crocodile River Music is an organization that has a lot of talented, motivated, musicians, who are willing to put their efforts into producing digital content, and they certainly have a great opportunity to establish a strong online presence. In order to leverage these strengths, they will need to be able to overcome some challenges of producing videos, achieve more interactivity in their online teaching, and be able to effectively promote themselves.

Recommendations

Our recommendations are in three categories: Product, Process, and Promotion.

Recommendation 1: Product improvements

For performances, focus on producing pre-recorded content as opposed to live streams. Due to their asynchronous nature, pre-recorded concerts have the ability to attract significantly more viewers than live ones. Live streams can still be used, mostly for expanding the audience of in-person events to online viewers.

For educational or instructional purposes, utilize a combination of pre-recorded material to showcase musical performances and Zoom classrooms. In these lessons, prioritize interactivity by utilizing breakout rooms with smaller groups of students, a virtual drum pad, and other activities which students can directly participate in.

Recommendation 2: Process improvements

Currently, producing high-quality videos is extremely time consuming. To help with this, Crocodile River Music can invest in some equipment that makes recording easier, including additional cameras, production equipment, and soundproofing foam. When producing videos, keep the 80/20 principle in mind: sometimes, the videos only have to be 80% perfect. The definition of what 80% means is subjective, so designating a director to make the final say would be helpful to this process. To learn best practices about video production, course creation, and editing, CRM can explore online courses.
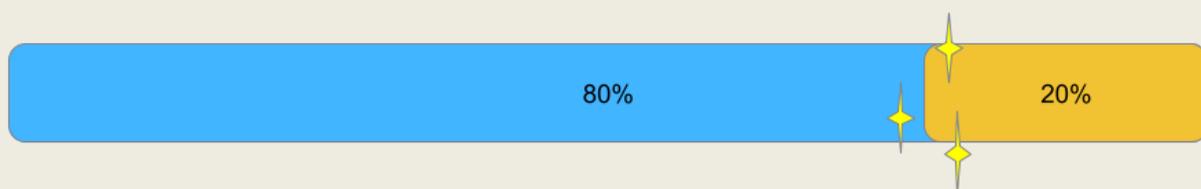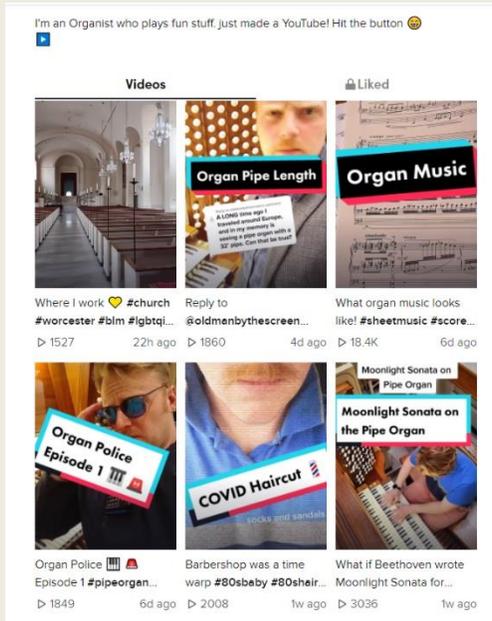

Figure E.3: 80/20 Principle visualized

Recommendation 3: Promotion improvements

To generate more excitement for their offerings, there are several specific strategies Crocodile River Music can employ. By using targeted advertising to promote their Facebook and Instagram posts, CRM can attract a much larger following. An additional method of promotion is a TikTok page, which can be used for both fun and educational content. This would help to generate excitement about their organization and could potentially reach many people in younger audience groups. Finally, for advertising to be successful, CRM can update their website to make their content easier to access and their messaging less confusing, so potential audiences and customers will be more likely to engage.

Figure E.4: Example TikTok Page (Hall, n.d.)

Conclusion

Crocodile River Music provides the Worcester community with a broad cultural experience and education. Exposure to a range of audiences and cultivating new students is an extremely important part of their mission. Crocodile River is ready to adapt to the new changes and opportunities learned in the last year. By curating a robust content library and growing their audience, they are situated to positively impact the lives of countless students and fans.

Acknowledgements

Authorship

Each member of the Crocodile River Music IQP team contributed equally to the research, data collection, writing, and presentation of this report. We also highly encourage future teams to 'post-up' in front of Turtle-Boy on their lunch outings as well.

Meet the Team

Augustus Doggett | WPI '22

Hi, I'm a Mechanical Engineering major from Portland, Oregon. Despite this project being completely different than what we expected, I'm extremely grateful for it and consider it to have been a rewarding experience. I felt that I was able to get involved with the Worcester Community in a powerful way, which is something that would have otherwise been quite difficult given COVID-19 restrictions. This project resulted in one of the best teamwork experiences I've ever had, and I'm extremely thankful that I had such fantastic partners.

Emma Fountain | WPI '22

Hi y'all! I'm a Biomedical and Electrical and Computer Engineering double major from Troy, New York. Even though we were unable to travel to India I feel that I still had the opportunity to learn about a new and diverse culture. Through this project I learned that you don't have to travel around the world to experience new things. Working on a local project, that has a visible impact on the community, has been one of the most valuable experiences of my life. I could not have done it alone and am exceedingly grateful for the support of my amazing teammates.

Meet the Team

Harrison Mazur | WPI '22

Hi friends! I am an Aerospace Engineering BS/MS student from Amherst, New Hampshire. Nobody could have expected how this year would turn out, but despite everything I want to highlight how rewarding it has been to work with an organization closer to home to create a positive impact, and to work with the best teammates ever, on and off the Zoom room. Time to start planning a trip to India!

Sara Stillings | WPI '22

Hiya there! I'm a Biochemistry major from Keene, New Hampshire. Unfortunately, we were not able to go to India this year, however, thankfully, to a wonderful organization and my amazing teammates, I feel like I still had the fruitful off-campus experience even without traveling. From exploring West African music to enjoying Indian food at Institute Park, doing a project for the local community has definitely been an enriching experience.

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Chapter 1: Introduction

The COVID-19 pandemic threatened many sectors of the global economy, and absolutely devastated a few. Among the industries severely hit, live music came to a standstill during the lockdowns and subsequent regulation on social distancing and indoor gatherings. Musicians were unable to share their music in the format and venues they had enjoyed prior to the pandemic. According to the Associated Press, the live events industry lost $30 billion worldwide in 2020, an outlet that represents the significant portion of revenue for performance artists (Fekadu, 2020). This project aimed to assist one group of African immigrant musicians and performers in overcoming the challenges presented by the transforming industry.

Crocodile River Music (CRM) is an education, outreach, and performance-based association of musicians located in the city of Worcester, Massachusetts. The organization promotes African music and culture in the region, with events at local venues such as Mechanics Hall and Tuckerman Hall in Worcester and the Providence Performing Arts Center in Rhode Island (Crocodile River Music, 2021h). In addition, as part of their education programs, Crocodile River Music runs interactive workshops that teach drumming, dancing, and drum making as part of its educational residencies (Crocodile River Music, 2021a).

The organization's mission is in "providing opportunities for many emerging and established African artists," however, disruptive events such as the COVID-19 pandemic can greatly impact normal operation (Crocodile River Music, 2021i). The organization needed strategies to improve resilience. While Crocodile River Music has adapted its programming with some virtual concerts and pre-recorded educational videos, there was still a pressing need to re-imagine how artists could earn an income through creative and resilient platforms (Crocodile River Music, 2021e). Therefore, the goal of this project was to help Crocodile River Music become more prepared by exploring ways for them to reach their audience through virtual and other sustainable modes of programming. In order to meet this goal, we identified the following objectives: 1. compare and contrast platforms and equipment for at-home production; 2. understand audience and artists' preferences for engagement; and 3. evaluate areas of growth and development for CRM's online presence. Meeting our goal meant providing recommendations to Crocodile River Music that had the potential to provide a secure future for the artists and their work.

Chapter 2: Literature Review

In this chapter we explore the background and setting for the project. We outline challenges faced by the musicians of Crocodile River Music, especially with regard to the COVID-19 pandemic. We review potential solutions, including currently available online platforms and previous attempts at audience engagement. We also profile the key stakeholders of this project: Crocodile River Music, the musicians who work with them, and their primary audiences.

2.1 How a Pandemic Altered the Music Industry

The COVID-19 pandemic had a major effect across the global economy, including the live music industry. Beginning in February and March of 2020, regions in the U.S. most affected by the pandemic began to enforce lockdowns. The implications for the live music industry were devastating. According to Nicholas Rivero, founder of a virtual events platform, six major professions related to the live music industry were affected by COVID-19. They included musicians; stadium employees; the shipping industry; the travel industry; production vendors; and set designers (Rivero, 2020). This further illustrates how many components make up the live music industry and how the losses incurred affect more than just musicians.

The live music industry saw a loss of 9.7 billion dollars in the year 2020 in just the United States alone (Fekadu, 2020). With such a big disruption in the industry, it is not surprising that the unemployment rate for the arts, entertainment and recreation category in 2020 stood at 17% (Woods, 2021). The National Independent Venue Association conducted a survey in 2020 that found that 90% of independent venues in the United States expected to close permanently (Pasbani, 2020). This shocking figure shows how even after lockdowns, many artists would be left without venues in which to perform. Furthermore, even if there are venues open, many audiences will be hesitant to return to live music concerts even after restrictions are eased (Primov-Fever et al., 2020). Looking forward, this is a serious concern for musicians since live performances can constitute up to 75% of their income (Pasbani, 2020). The outcome is extremely problematic and leaves those in the music industry in a vulnerable position.

2.2 Community Partners and Artists

The stakeholders involved with this project include the full range of the performance experience. That means Crocodile River Music as an organization, their musicians, and the audiences they serve. In this section, we explore the intentions of CRM with regard to their audiences, and we provide additional insight into the background and experience of the musicians.

2.2.1 Crocodile River Music

Like most performers in the entertainment industry, the musicians at Crocodile River Music (CRM) have found the process of adapting suddenly to digital audiences and music sharing to be complicated and have struggled to generate enthusiasm among their fans. As the core talent at CRM, the musicians and performers lost their primary platform for sharing their educational and artistic outreach with the local community. After more than a year, Massachusetts remains in a state of emergency and has continued to impose restrictions on gatherings. Until recently, gatherings were limited to ten people indoors, and twenty-five people outdoors, though that limitation has been increased to 100 people indoors and 150 outdoors (March 22 Appendix to COVID-19 Order #63, 2021). This limitation made it essentially impossible for musicians to perform in-person concerts. As performers whose careers were crafted around live concerts, this change was upending, and creating and maintaining a following online was a vastly different task than doing so in a live concert setting.

Crocodile River Music's mission is to "bring the music, art, and culture of Africa to New England and beyond in an effort to spread awareness and inspire new ways of cultural thinking" (Crocodile River Music, 2021e, para. 1). Despite the pandemic, CRM was motivated to continue to share African music and culture with the wider community. The organization has always focused on education ranging from primary school to the university-level (M. Fernandes, personal communication, February 18, 2021). Their partners include schools and organizations who want to learn more about African music. This arrangement brought artists at CRM to share their cultural heritage and artistic skills with viewers; in turn audiences provide revenue by attending performances at CRM headquarters, purchasing digital media, and attending shows at area schools. These performances were partially funded by grants, and partially funded by a fee the venue provides.

Figure 1: Crocodile River Music logo(Crocodile River Music, 2021e)

Currently, the organization is well-equipped with excellent resources in their facilities. They have sufficient space for media production, as well as some equipment for recording and producing video/audio recordings of their artists' music (M. Fernandes, personal communication, February 18, 2021). Until now, they have leveraged those studios to create educational content for schools and members of the community. Fortunately, CRM musicians have the resources they need to create music; they simply need more effective ways to share it.

2.2.2 West African and World Music Heritage in Worcester

Crocodile River Music helps audiences of all ages learn about different cultures and develop appreciation for art and music from various backgrounds. There is much to learn from each other and by sharing music from other parts of the world, the artists at CRM enable audiences to explore new and diverse musical genres. Because of CRM, Worcester and New England communities have a valuable resource to experience traditional music from many different countries. Crocodile River Music has a focus on West African music, with additional activities featuring artists from Kenya, Senegal, and Mali as well as a calypso band, African dance troupe, and visual storytelling. West African music alone has a wide variety of music styles, with many influential countries in the region, as seen below in Figure 2 with fifteen countries highlighted.
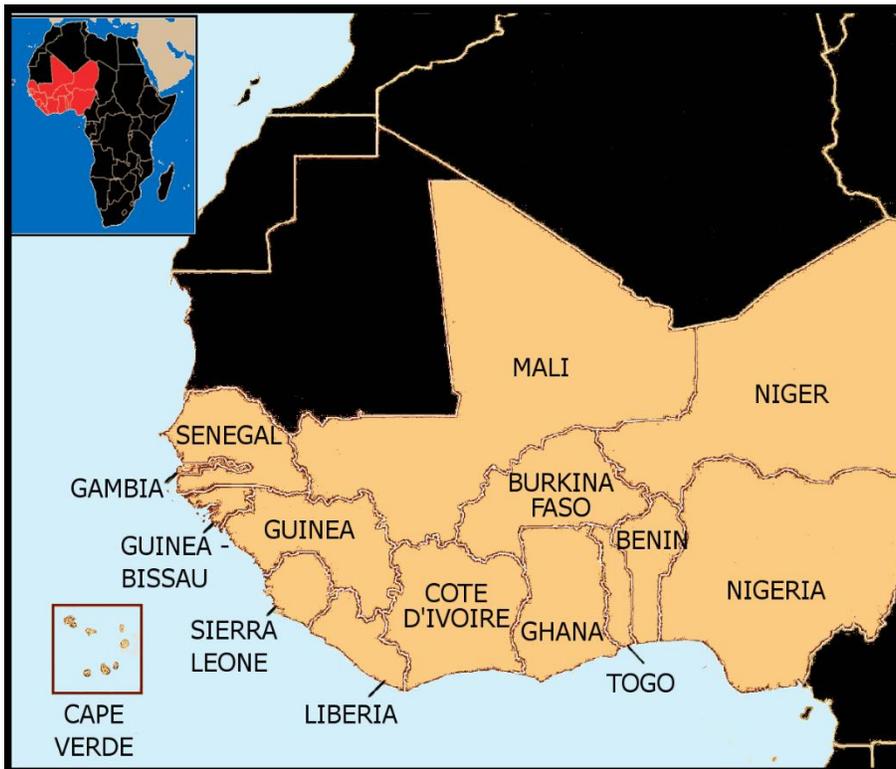
Figure 2: Regional focus of music at CRM Map depicting West Africa (Magic, 2009)

Key components of West African music include unique styles of rhythm and the high use of percussion instruments (Wilson, 1974). The many different styles of rhythms can be observed across multiple instruments including djembe and tama, both types of drums played by CRM musicians. Furthermore, CRM amplifies a kind of music that has become known in the U.S. For example, Boubacar Traoré and Ali Farka Toure have a sound identifiable globally (Last.fm, n.d.). Boubacar Traoré is a Malian, self-taught guitarist who was seen as the "Elvis Presley of Mali" in the 1960's on electric guitar, yet who also plays across genres including blues (Lusafrica, n.d., para. 2). On his most recent album, Traoré recorded with American swing and folk artists in Mississippi, bringing together a wide variety of influences (Lusafrica, n.d.). Traoré can be seen pictured playing a guitar in Figure 3.

Figure 3: Boubacar Traoré (Schertzer, 2011)

Ali Farka Toure, seen in Figure 4, is also a Malian guitarist, who has performed with both traditional African guitars and with more western instruments (Tagles, 2005). Their success has catalyzed a demand for West African music on a global scale, and by extension in New England, as provided by the CRM platform.

Figure 4: Ali Farka Toure (Tagles, 2005)

Crocodile River Music's specific goal to share African culture in New England brings a unique position to both educate the community, as well as provide opportunities for their musicians to achieve success.

2.3 How Digital Platforms are Changing Performance Spaces

The opportunities for reproducing live performances in digital educational and artistic spaces are enormous. The development of video sharing platforms has enabled musicians to share music and connect with audiences around the world. This has revolutionized the music industry and allowed independent artists to promote their music to a wider and even global audience. The most well-known platforms for video sharing currently include YouTube, Facebook, Instagram, and TikTok. Each of these platforms has different capabilities and reach different kinds of audiences, but few musicians are able to support themselves with the money earned on the aforementioned sites. For many of the performers on these platforms, most of their revenue solely came from live audiences (performances and tours) (Hracs & Leslie, 2014; Riemenschneider, 2020).

Since the start of the pandemic, musicians have had to rely on these video sharing platforms and their fans in order to generate income (Riemenschneider, 2020; Vnukowski, 2020). Figure 5 compares YouTube and Vimeo, two video sharing platforms that can also be used for live streaming.

YouTube
- Video sharing platform
- Do not need an account to view videos
- Free to upload videos
- AAC 128 kbps bitrate*
- Large audience capability

Vimeo
- Video sharing platform
- Need an account to view content
- Costs $75 per month to access all aspects of Vimeo
- AAC 320kbps bitrate*
- Niche audience
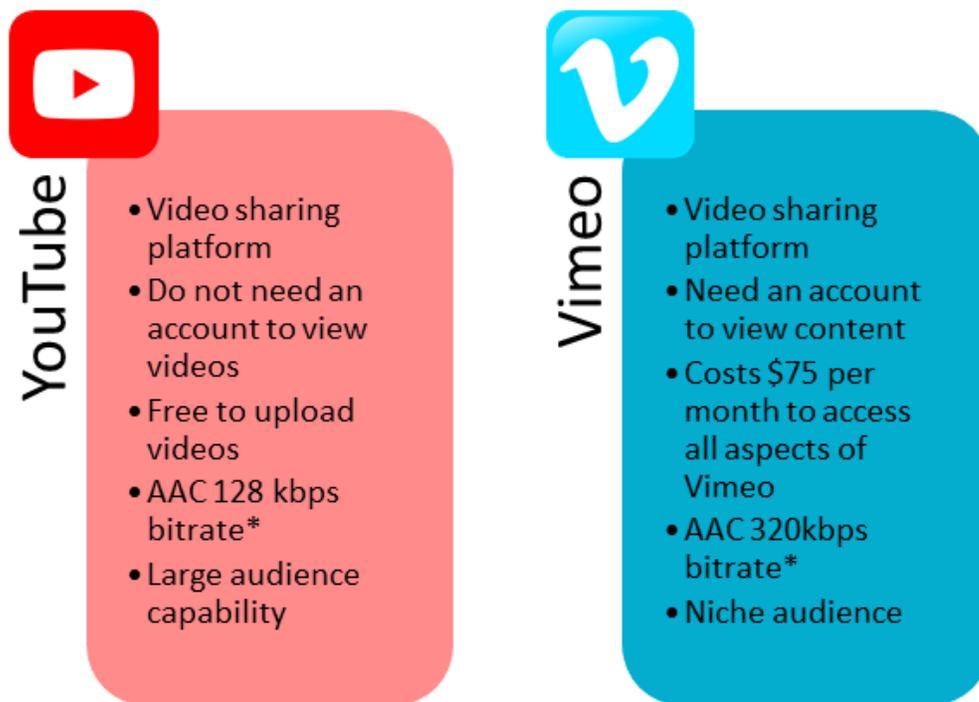
Figure 5: YouTube and Vimeo Comparison
*For AAC, advanced audio code, a higher number means that less audio information is lost in transmission.

According to YouTube's official blog, in its favor the site has more than "2 billion monthly logged-in users" (YouTube for Press, n.d., YouTube by the Numbers section). Although the data that correspond with this statistic are not listed, artists uploading videos to YouTube have the potential to reach a very large number of viewers. Facebook, Instagram, and TikTok have different viewer interfaces when

compared to the two video sharing platforms discussed above. Furthermore, Facebook owns Instagram and therefore the video quality between the two is very similar. For a brief comparison of these three platforms and their capabilities see Figure 6.
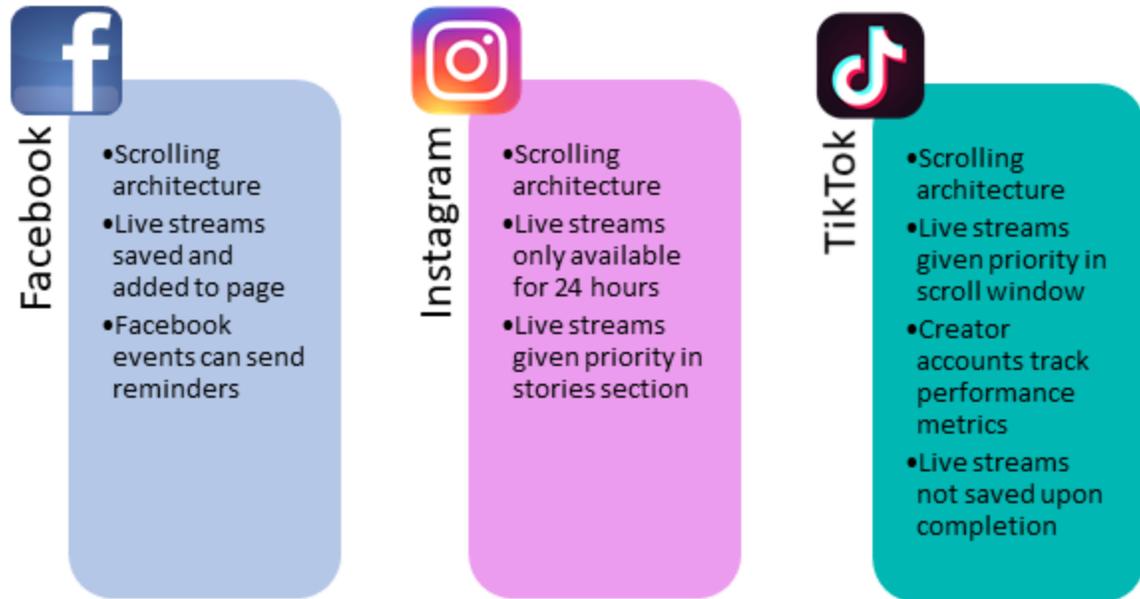
Figure 6: Facebook, Instagram, and TikTok Comparison

Consequently, when choosing between all available platforms, the musician must decide what they value more: exposure or video permanence.

All five platforms - YouTube, Vimeo, Facebook, Instagram, and TikTok - have live streaming capabilities. These platforms are user friendly and the most well-known. They also provide monetization opportunities for creators such as musicians. For YouTube, revenue is based on views, subscribers, and advertisements. This is true for other platforms including Facebook and Instagram, which also can add options for tipping the artist via Venmo and other donation paying apps. Table 1 illustrates a more detailed breakdown of the monetization opportunities offered by each platform.

Table 1: Breakdown of Monetization of Media Platforms

Platform	Requirements	Source of revenue
Facebook	-10,000 followers -30,000 views in the last 60 days (Wong, 2020)	-Advertisements
YouTube	-1,000 subscribers -4,000 public watch hours in the last year (Wong, 2020)	-Advertisements -Channel membership -Merchandise shelf -Super Chat and Super Stickers -YouTube premium revenue
Vimeo	-None	-Vimeo On Demand -90% of revenue after fees and taxes (Vimeo Help Center, n.d.)

In summary, no single platform offers all the functions needed to promote content, live stream concerts, and make a profit. For Crocodile River Music, a combination of a video sharing platform, live streaming platform, and monetized platform is required to meet all their needs, depending on their audience demographics, specifically age, for the users of the different platforms.

2.4 Case Studies: Learning Best Practices from Online Sharing

In order to produce music, some artists are turning to at-home recordings, and virtual performances. Here we learn from several models for adaptation.

Case 1. Soundscape Equipment List
Keeping students engaged and excited about educational material in an online setting is one of the fundamental challenges for virtual learning. Michael Parsons, the director of a group from Briarcrest Christian School called Soundscape, had his students make individual recordings at home, and assembled the pieces into a full ensemble using iMovie to recreate Billie Eilish's song, "Bad Guy." Parsons noted that the reaction to the video was positive, and it was "a fun and meaningful way for

the students to feel connected, [...] it helped bring our school community together" (Parsons, 2020, para. 3).

To create virtual ensembles, artists need a minimum amount of equipment to record their performances. According to Tim Chan from Rolling Stone magazine, a home recording studio requires a computer, Digital Audio Workstation (DAW), audio interface, microphone, and headphones at a minimum (Chan & Chan, 2019). These items can get expensive quickly; for example, the recommended laptop workstation is a Macbook Pro, priced at over $1000.00 USD (Apple, n.d.). However, if an artist is not going to do the audio mixing and production, the SoundScape example proves that audio can be recorded in remote locations on smartphones, and then compiled in a central location. Depending on the technology available to CRM, artists could potentially record their pieces remotely and have them assembled at CRM headquarters. This presents the opportunity for music distribution, sharing, and streaming that was previously unavailable, although with compromises to quality and time spent on the final process.

Case 2. Thinking About Scale

When looking at case studies for this project, it was important to select examples in which the artists do not already have large followings, since the more popular artists are already at an advantage based on their reputation alone. An excellent local example of success is Music Worcester, a community organization dedicated to bringing "inspiring and varied musical experiences to expanding audiences through concerts, performances, and educational programs" (Music Worcester, n.d.-a, para. 1). Since the beginning of the pandemic, Music Worcester has employed a variety of methods to connect performers with their audiences, including live concerts, during which customers paid a fee and view the concert in real time; and "on-demand" concerts, which are pre-recorded and available for a limited time period, also for a fee (Music Worcester, n.d.-b, n.d.-c). In addition, Music Worcester published artist-hosted videos on their website, which covered a variety of topics ranging from concepts of music theory to their creative process (Music Worcester, n.d.-d). Unlike the concerts, the videos were available to stream for free, and helped the organization generate interest for their paid content. Music Worcester provided an excellent example for resilience, because, unlike a video streaming site or social media platform, they found a way to monetize their content without drastically changing their business model. While they appear to be a larger organization than CRM, they have a similar mission statement and offer many of the same services, making some of their solutions highly compatible with the goals of this project.

Case 3. Lessons Learned from Trial and Error in 2020

Daniel Vnukowski documented his experience with live streaming and synthesized best practices found through his own research. Vnukowski describes a real account of the trial-and-error processes that many musicians were experiencing. He is a pianist who, like many musicians, found himself unable to perform in-person concerts. At the beginning of the pandemic, Vnukowski conducted a

survey of one hundred participants that asked questions regarding live streams specifically: duration, time of day, entry fees, audio quality, access to videos post-performance, and the number of hours spent watching streams (Vnukowski, 2020). The results of this survey show that 60% of respondents used their laptops to watch livestreams and that the livestreams should be between 45 to 60 minutes in length (Vnukowski, 2020). Respondents would be willing to pay $15 as an entry fee for live streams, however instituting a donation model would allow fans to voluntarily pay more. Both the audio quality and the performance quality were very important to viewers, as well as the ability to access the performances after the livestream (Vnukowski, 2020).

For artists, some of the important lessons of his study include the importance of bandwidth for uploads, creating a performance environment, and the availability of live streaming platforms. Vnukowski suggests that musicians monitor their upload bandwidth capacity to identify an ideal time for live streaming. There are many factors to consider when setting up a performance space at home: ambient noise, room acoustics, and glare (Vnukowski, 2020). He has suggestions for cameras and microphones to help mitigate these issues. Finally, he found that for his purposes YouTube worked better than Facebook, however, he reveals that Vimeo was simple to work with and produced the best quality streams. He notes that Vimeo is more of an investment for musicians due to the cost, and he personally uses Twitch and YouTube for his livestreams.

The year of the pandemic forced many artists to attempt different styles of virtual engagement, and though there are common requirements for each style, each comes with their own set of benefits and challenges.

2.5 Summary

In summary, our research revealed that Crocodile River Music brings unique educational opportunities as well as entertainment to the local community. Enabling them to share their art was important for highlighting the significant contributions to global music from the cultures they represent. The pandemic exposed weaknesses in the music industry and so diversifying methods for sharing content is a necessity. Understanding the background of the artists, the range of challenges with online platforms, and the successes and struggles of others provided a strong foundation for this project.

Chapter 3: Methodology

The goal of this project was to help Crocodile River Music become more prepared by exploring ways for them to reach their audience through virtual and other sustainable modes of programming. In order to evaluate the most efficient and successful solutions for Crocodile River Music, we have outlined our data collection strategies in detail below (Figure 7).
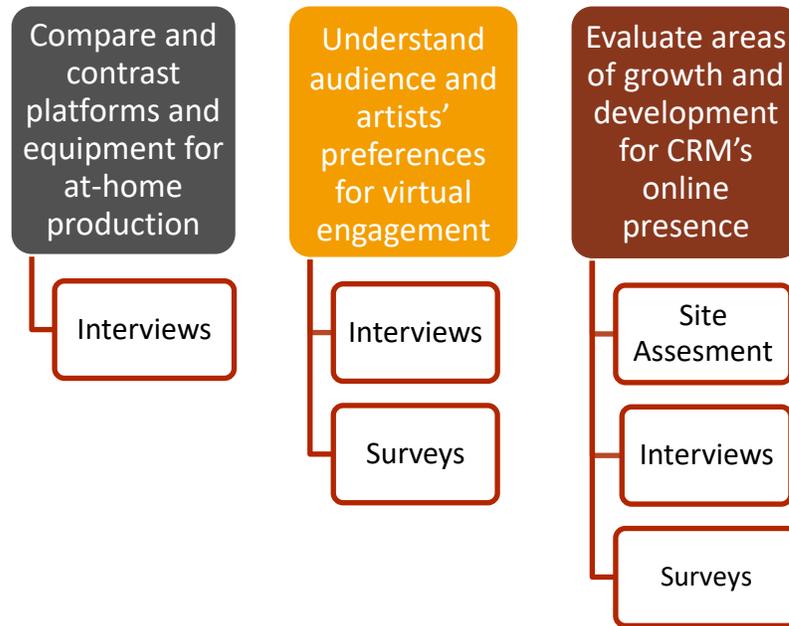
Figure 7: Strategies for data collection

3.1 Compare and Contrast Platforms and Equipment for At-Home Production

Our first objective was to learn more about the various content sharing platforms and equipment required for musicians to interact with their audience virtually. To accomplish this, we conducted interviews with artists and music promoters. This information allowed us to not only identify platforms but also helped in distinguishing what each platform offers and which would work best for the musicians at Crocodile River Music.

To identify potential platforms, we documented which streaming platforms different artists have used, including information on what the platform offers, such as monetization, video and audio quality, and other special features. We compiled these data into a Pugh matrix that gave us an understanding for what each platform offers.

In addition to the decision matrix, we conducted interviews with those who are experts in the field of musical production to make an informed recommendation. These interviews were primarily conducted through Zoom, which allowed us to follow social distancing guidelines for COVID-19, and also enabled recording so they could be reviewed later. Prior to each interview, we obtained vocal and written consent for both using the data and recording the interview (see Appendix A). We decided to use semi-standardized interviews, which followed a list of questions, but also allowed for organic conversation development (Berg & Lune, 2011). This format was optimal, since given our background research, we had some knowledge of the topic we were discussing and could address new topics as needed.

In addition to collecting data on the available platforms during these interviews, we also gathered information on the resources needed to produce content for these platforms. This included identifying microphones, cameras, and software that could potentially be used for the creation of virtual content. Included in Appendix B is a list of sample interview questions which guided these interviews. This collected data was then organized into a list of equipment and software needs, with recommendations on certain models and packages.

For interview participants, we reached out to faculty experts in the music/media production programs at Worcester Polytechnic Institute, and additional experts in the industry that could be reached by Zoom. We continued to seek referrals through snowball sampling, which involved asking for referrals of other individuals with similar attributes (Berg & Lune, 2011).

3.2 Understand Audiences and Artists' Preferences for Virtual Engagement

Our second objective was to identify and understand audiences and artists' preferences for virtual engagement. This objective entailed the documentation of stakeholder ability, skill, resources, and preferences when using a platform to connect musicians and audiences. We expanded the interviews from section 3.1 with additional questions specifically tailored to musicians. These questions addressed factors such as sharing capability, quality of experience, and audience interaction. The additional questions satisfied this second objective using our initial pool of participants while removing the need for multiple interviews. Combining the separate interviews also avoided scheduling complications given our seven-week time frame.

To assess the preference of audiences, we developed two surveys. Both surveys were anonymous and web-based through the WPI Qualtrics platform. The first survey (Appendix C) was targeted to administrators and educators at schools that CRM had previously partnered with. The goal of this survey was to obtain information on the preferences of the schools with regard to virtual workshops. The second survey (Appendix D) targeted the general population and was distributed using existing

WPI club listservs and other points of contact, obtained by convenience sampling. The goal of this second survey was to discover which content and distribution methods a potential audience would be interested in, containing a series of close-ended questions for simple analysis. The survey asked audience preferences regarding elements of virtual engagement such as video length, audio quality, and average time spent on platforms. The nature of virtual performances assumes that the audience has access to the internet, so conducting our survey solely over the internet did not exclude individuals in the target population. Because of the difficulty of collecting data from minors, we adapted the survey to target adults. The survey included a consent script, which is included with the consent forms in Appendix A.

3.3 Identify Areas of Growth and Development for CRM's Online Presence

Our third objective was to identify areas of growth and development for Crocodile River Music's online presence. We began this process with a site assessment in order to understand the popularity, revenue potential, and viability of the current programs CRM offers. To get a baseline understanding of CRM's programs, we conducted semi-standardized interviews with CRM founders, employees, and administration. The questions, found in Appendix E, focused on details regarding their programs and also provided us with information such as how many people attend events, and which of their new virtual offerings are doing well and why.

Another domain that helped inform us of the success of Crocodile River Music's virtual programs was the perspectives of their current audience. We encouraged a sample of their audience to give feedback on their experience with CRM's online presence, which in turn, allowed us to identify more precisely what CRM does well, and what aspects of their programming could use improvements.

One useful social media platform to disperse our survey was Instagram. Part of the Instagram Story feature allows polls to be conducted with simplicity, and CRM already had established a presence there. This enabled easy gathering of feedback and tracking of results, while also encouraging more engagement (Riserbato, n.d.). In these polls, we asked CRM's followers what services they have used from CRM throughout the past year to assess their current offerings (see Appendix F). Since these were informal and short polls, there was no need for a consent script to be given. Once all of the information from the interviews and surveys was collected, we conducted a SWOT analysis to examine the strengths, weaknesses, opportunities, and threats facing CRM to help them identify areas of growth and development.

Chapter 4: Results and Discussion

In this chapter we shall discuss the results of our research. After performing interviews and surveys with key stakeholders, as well as conducting additional research, several themes emerged. Our findings are described in detail by objective below.

Part 1. Results

Objective 1. Compare and Contrast Platforms and Equipment for At-Home Production

After conducting interviews with WPI music professors and other music production specialists, we gained considerable information about available platforms, and useful insights into equipment and software options. Many of our respondents were themselves initially hesitant about producing content online and felt that online concerts cannot replicate the live experience, but there were valuable lessons learned in the course of the pandemic. Among the respondents, most had used some combination of live streaming and pre-recorded videos and were able to give recommendations for equipment and software with which they had found success.

Through our interviews, we learned that there are numerous pieces of equipment that go into producing virtual musical content, including microphones, cameras, mixers, lighting, soundproofing, and other elements. Given the vast range of models and brands for these pieces of equipment, it was evident early on that we could not expect that all items are used consistently, but rather we acquired recommendations that could augment CRM's current setup effectively. While many of our informants recommended specific equipment, most of respondents were not particularly concerned about the brand of the equipment used and had mostly chosen it due to familiarity.

Crocodile River Music's Current Studio

During a discussion with Dr. Marino Fernandes, our sponsor partner for this project, we were able to determine the equipment that CRM already owns. They have a robust recording space, with individual microphones for each instrument and several other field and voice microphones. These are mixed using a QSC3 mixing station and use a Windows PC for sound editing. In terms of camera equipment, they have a DSLR camera, and some lighting panels that can help them frame shots. While these items form part of a professional studio environment, there are a few problems. There is a significant amount of echo and reverb in the room, which makes sound quality in videos suffer. This is due to the fact that they have little to no soundproofing. While CRM has considered soundproofing the space already, Dr. Fernandes expressed concerns about diminishing the aesthetics of the space, which are an important component in their videos (M. Fernandes, personal communication, April 19, 20l21). The space could also benefit from some better lighting, according to Dr. Fernandes. Finally, there is only one camera, which means that each shot has to be set up every time, which increases the time it takes to record videos significantly.

While CRM's studio (Figure 8) is terrific for recording highly professional videos, it requires significant time to set up and make sure everything works correctly. For some types of content, this level of production quality is not necessary, so we explored options with lower technical buy-in as well, simple enough for a single person to set up with just one smartphone.

Figure 8: Crocodile River Music's current space

Personal Smartphone Setup

For producing videos for TikTok and other informal social media platforms, we received advice from Wesley Hall, an organist at the First Baptist Church in Worcester and a rising TikTok star, who uses his smartphone to shoot and record all of his videos. For his setup, he uses a phone with the best camera he could find, as well as an external USB microphone (W. Hall, personal communication, April 22, 2021). The microphone is a $40 unit from Movo, the VXR10 (shown in Figure 9 below), which can connect to any device with a 3.5mm audio jack (Movo, 2021). While Wesley stated that this was a useful option for him, he is looking to upgrade to something slightly nicer (W. Hall, personal communication, April 22, 2021). For this particular kind of media performance, however, the simpler format can be fine, as corroborated by Ben Wesenberg, an audio engineering student at Indiana University. Ben works with the IU student radio station, WIUX as a vice president, and he recommended the $50 Snowball USB mic from Blue (shown in Figure 10 below).

Figure 9: Movo VXR10 Microphone (Movo, 2021).

Figure 10: Blue Snowball USB Microphone (Blue, 2021)

Professional Studio Setups

For recordings with high production value in mind, we received several specific recommendations on cameras, acoustic proofing, software, and general production equipment. These came from professors in the WPI music department who have their own studios, as well as several other contacts we obtained through those professors.

Cameras

In terms of cameras, Professor Bianchi of the WPI music department recommended the Mevo Start Camera, shown in Figure 11, due to its ease of use and setup simplicity. He noted:

> *Mevo....two of these cameras, you can cover the stage pretty well...nice thing about this camera is that it is, well, it can go right into an internet*

box with this which means I can put it on an internet circuit or an internet network (F. Bianchi, personal communication, April 8, 2021).

Figure 11: Mevo Start Camera (Mevo, n.d.).

These cameras typically cost around $400, which Prof. Bianchi stated was a "reasonable" price (F. Bianchi, personal communication, April 8, 2021; Mevo, n.d.). Because of their affordable price and ease of connectivity, they are ideal for a multi-camera studio setup.

Camera Control

One method for controlling Cameras is an HDMI switcher, which can also be used to switch cameras in real time. Brett Maguire, who organized and produced a live streamed concert for the Salisbury Singers on March 14th, 2021, describes HDMI switchers and their uses:

> *There's devices that you can have that let you plug in multiple cameras. So we had a camera that was set up on the organist. We had a camera that was on the conductor. We had a camera for like singers on the left and a camera for the singers on the right. And with that device, you can plug all those cameras in and do a live broadcast either to Facebook or to YouTube where you can just with one button switch, which is broadcasting* (B. Maguire, personal communication, April 20, 2021)**.**

These devices, such as the Newcare model shown in Figure 12, typically cost under $20 on Amazon.com, depending on the number of channels they can switch between (Newcare, n.d.).

Figure 12: An HDMI switch (Newcare, n.d.).

Another method for controlling cameras is live streaming production software. Prof. Bianchi recommended Studio 6, which is a live production suite offered by Vimeo Livestream. It allows for complete camera control for any wired camera, audio mixing, and live streaming capabilities to multiple platforms (Vimeo, 2020). Prof. Bianchi was quite enthusiastic about Studio 6, stating that it "offers every bell and whistle" (F. Bianchi, personal communication, April 8, 2021).

An alternative to Studio 6 is OBS Studio, which is a free, open-source streaming studio software. Prof. Ibbett has worked with it before and had this to say:

> *OBS -- is it's like a TV studio with the features you can do Dynamic transitions between multiple feeds you can do overlays you know it has all the graphics and it's free but it's you need to be highly trained to use it* (D. Ibbett, personal communication, April 8, 2021).

The software can easily send the video live stream to a variety of platforms, including YouTube, Facebook live, and Zoom (D. Ibbett, personal communication, April 8, 2021). The video can also be saved as a local file on the host computer.

Both options for controlling cameras, either software or the HDMI switcher have their limitations. The HDMI switcher is very easy to set up but is quite limited in functionality and may require additional hardware to work correctly. Software, such as Studio 6 and OBS, have much better capabilities, but are generally harder to set up and require some training in order to be proficient with. Both are viable options, and it is simply a matter of determining which works best for the users and equipment they have to work with.

RESULTS AND DISCUSSION

Sound Proofing

Sound proofing is an important part of any production space, and extremely important for maintaining high quality audio during recordings. Prof. Scott Barton, an instructor at WPI and a professional composer who has his own studio had this to say:

> *Acoustic treatment is fundamental for performance and recording spaces. There are all sorts of issues (e.g. flutter echo, room nodes) that persist without such treatment, which meaningfully affect the sound produced. There are many companies that make acoustic panels … and there are even some that you can print your own images on, … so there are a wide range of aesthetic options* (S. Barton, personal communication, April 22, 2021).

The two companies that Prof. Barton recommended are Auralex and GIK Acoustics. These both offer acoustic paneling with printing on them, as well as many other aesthetically pleasing options.

Audio Editing

In terms of audio editing software, typically referred to by professionals as a Digital-Audio Workstation (DAW), the two most mentioned were Ableton Live and Logic Pro X, but there does appear to be a few other viable options. Table 2 below, which is adapted from a document on recording tips shared to us by Prof. Joshua Rohde of the WPI music department, breaks down the pros and cons of various DAWs.

RESULTS AND DISCUSSION

Table 2: Breakdown of Music Production Software, listed in order of capabilities (Rohde, 2020).

Name	Platform	Cost	Pros	Cons
Audacity	All	Free	Simple and easy interface	Limited tracks and input protocols DO NOT try to mix on this
Garageband	Mac	Free	Simple and streamlined interface. Relatively easy to learn installed on all Macs	Limited in production functions
Ableton Live lite	PC, Mac	Free	Gives basic features and plugins found in Ableton Live Suite	Allows only 8 tracks Cannot use 3rd party plugins
Cakewalk by Bandlab	PC	Free	Incredibly powerful with no limitations on tracks or busses. Can play video synced internally as a guide. Has multiple preset views to simplify the interface.	Can be confusing if you open extended views. Can get cramped on a smaller monitor.
Pro Tools First	PC, Mac	Free	16 tracks of audio and 16 of instruments. Same format and layout as the full version which is an industry standard Education price: 1 year subscription $99 Education price: perpetual license $299	Can **ONLY** save to 1GB of supplied cloud storage Free version only allows 3 saved projects.
Studio One 5 (Prime)	PC Mac	(Prime): Free Artist: $100	Unlimited tracks, virtual instruments, and FX channels Intuitive drum and melody composition	Takes some time to get used to controls Less functionality than the paid versions of Studio One
Pro Tools	PC, Mac	$300	Used a lot in the professional industry Has many features 3rd party plugins allowed	May be a little bit tricky to deal with at first if no recording/mixing experience
Logic Pro	Mac	$200	No limits on tracks, bus, plugins, or effects Fairly simple to connect to a microphone and set up to record Interface is much more intuitive than Ableton Live Basically an upgrade of Garageband	Mac only May be a little bit tricky to deal with at first if no recording/mixing experience
Ableton Live	PC, Mac	Free 90 Day Trial	Extensive with full features in the 90 day trial version	More complicated to start with as the performance view and timeline sometimes conflict

		Standard: $450	Can use 3rd party plugins	
			Great for midi production	Better used for midi tracks/instrumental production
		Suite: $750	Used in professional industry	Harder for first time users

One piece of software not mentioned in this list is Listento by Audiomovers. This is a plugin that works with any DAW and can be used by audio mixers and engineers to collaborate in real time without physically being in the same room (V. Manzo, personal communication, April 9, 2021). This software is not standalone, rather it is used to augment the editing software being used by the audio production team. It is also able to stream high-definition audio (V. Manzo, personal communication, April 9, 2021). Prof. Manzo of the WPI music department explained how Listento was able to help him adapt to COVID-19 restrictions:

> *I have recently been using a product Audio Movers called the Listen To plug-in. Something that I do quite a bit about is I do a lot of recording in my own studio and composition, and then I work with a mix engineer, who I trust, who has pieces of hardware in his studio, and I needed to find [a way to do this remotely]. In the old days, I used to just go over and listen to his mixes on his speakers and sit with him, and that was quite great. With that being risky, we've used Audio Movers: he drops a little plug-in onto his under the master track. … It gives him a URL, he can choose the bandwidth setting of the audio as it's coming out there and I can listen in on uncompressed audio, to whatever mixes he's doing. So it's quite useful if you have a decent internet connection … and there's no … tool needed on my end to receive that, I can just load up in the browser even on my phone and [it] … just comes through as live streaming … and that's actually quite exceptional* (V. Manzo, personal communication, April 9, 2021)*.*

Most professors were not attached to the software they used and emphasized that familiarity and convenience is more important than functionality. Prof. Bianchi personally uses Pro Tools, but noted:

> *If you can find a platform that thinks like that appears to be really ahead of the rest of the field, it makes sense to recommend that because it's probably ahead for some reason* (F. Bianchi, personal communication, April 8, 2021)*.*

It is important to keep up to date on the current software offerings, but it is not critical to change the software being used unless there is a good reason to do so.

RESULTS AND DISCUSSION

Platforms

For publication of online concerts, YouTube was easily the most frequently mentioned platform, with musicians using a combination of video production and live streams. YouTube was primarily used for documenting and publishing performances of rehearsed music. In all cases, respondents emphasized that they much preferred media with high production values, using multiple camera angles and high-fidelity audio encoding. Successful online concerts are cleanly filmed, with good audio and quality content.

For educational lessons and assessments, most said they had success using Zoom, despite the fact that it is not optimized for music. Because of the inconsistent latency and audio compression, Zoom could not effectively be used for large ensemble rehearsal, but it could be used for call-and-response teaching methods, so most instructors spent more time with individual students as opposed to trying to coordinate large ensembles. Several music faculty stated that this was a positive change, because it allowed them to give more specific feedback to students.

In order to better assess optimal platforms, we compiled our information into a Pugh matrix. The Pugh matrix (Table 3) uses weights established by a pairwise comparison chart, which can be observed and is explained in detail in Appendix G. The weights allow more or less relative importance to be attributed to the variables, listed in the leftmost column: user demographic, user retention, audio quality, video storage, monetization, popularity, and ease of content creation. The columns along the top are some of the more popular platforms, drawn from conclusions from our interviews and research. Each platform is compared to a baseline, which represents the approach CRM is already taking. A score of 0 means that the platform is equal to the baseline, a score of -1 means the platform is worse than the baseline, and a score of +1 means that it is better than the baseline. Once the platforms have been scored based on the variables, the scores are computed by multiplying the weight by score for each variable for a given platform, then summing the weighted scores.

Table 3: Pugh Matrix Analysis (1 is better than baseline, -1 is worse than baseline, 0 is at baseline)

	Weight	Baseline (current approach)	YouTube	Facebook	Vimeo	Instagram	TikTok
User Demographic	1	0	1	0	-1	0	1
User Retention	4.5	0	1	0	1	0	1
Audio Quality	2.5	0	1	-1	1	-1	-1
Video Storage	3.5	0	0	-1	0	-1	0
Monetization	1	0	1	-1	1	-1	0
Popularity	4	0	1	0	-1	0	1
Ease of content creation	4.5	0	-1	0	-1	0	1
Rank/ Total	x	0	8.5	-7	-1.5	-7	11.5

According to the data, the options which scored the highest are TikTok and YouTube. The factors that made them stand out compared to Facebook, Vimeo, and Instagram are their advantages with user retention and popularity, and in the case of TikTok, ease of content creation.

Objective 2. **Understand Audience and Artist Preferences for Virtual Engagement**
Through our interviews with musicians, a common denominator in our conversations was found to be the fallout from COVID-19 fatigue. The musicians we interviewed had to find alternative ways for performing and earning money. Since most of the musicians also had other sources of income, we noticed an increased focus and effort on those kinds of options. For many musicians, this secondary source of income is teaching music lessons.

The challenges associated with virtual education seem to focus on the task of engaging with students. Elements that contribute to a successful virtual lesson include making it fun, unique, interactive, and engaging. One WPI music faculty member said that the "online space for educators definitely requires some interactivity-- interaction" (P. Buono, personal communication, April 7, 2021). Another suggested keeping younger students (children) "guessing" by using funny face filters (D. Ibbett, personal communication, April 8, 2021). Most of the pandemic year was spent on Zoom in various scenarios, and similarly, music education classes conducted over Zoom offered a direct interaction between the students and musicians. It does work well for smaller groups and individual lessons because of the greater capacity for interactivity.

All of the musicians that we spoke with were in agreement that there is no replacement for live music but there is definitely a demand for creative and well-produced live streamed or pre-recorded

performances. One example of a successful live stream includes the Music at Trinity concert series, where musicians performed at Trinity Lutheran Church. These performances were then live streamed to YouTube and Vimeo. Mark Mummert, the Cantor for Trinity Lutheran Church, organized these events and attributed his success to it having a positive message associated with the performance and heavily promoting it with social media and email blasts:

> *I do a lot of social media presence [and] we send a Mail Chimp email out. The emails often have video clips in them… to get people excited about the performances or particular performers. I'm a big proponent in creative advertising. How to get [people] excited about a project and see that coming to this performance or watching this performance is part of a whole thing...You kind of have to h*ave a theme and a hook to pull people in to say, this is why we're making this music (M. Mummert, personal communication, April 16, 2021).

One of the musicians we spoke with was a participant in this concert series and she felt that it "was a wonderful experience being live streamed" (M. Hatch, personal communication, April 7, 2021).

The realization that live streams and virtual performance have the capacity to reach global audiences and connect musicians around the world was an unexpected benefit that emerged this past year. Through the live streaming of worship services Trinity Lutheran Church now has viewers from across the United States. Because of this development the church will continue to live stream all their services once the pandemic is over. One of the professors we spoke to also commented that he now teaches students globally and that his music lessons with students are no longer dependent on school breaks. This allows him to have a more consistent source of income.

Survey Results

After examining our survey results, we noted a few important trends. Our survey was distributed by convenience to mostly students of college age, constituting 81% of the total respondents.
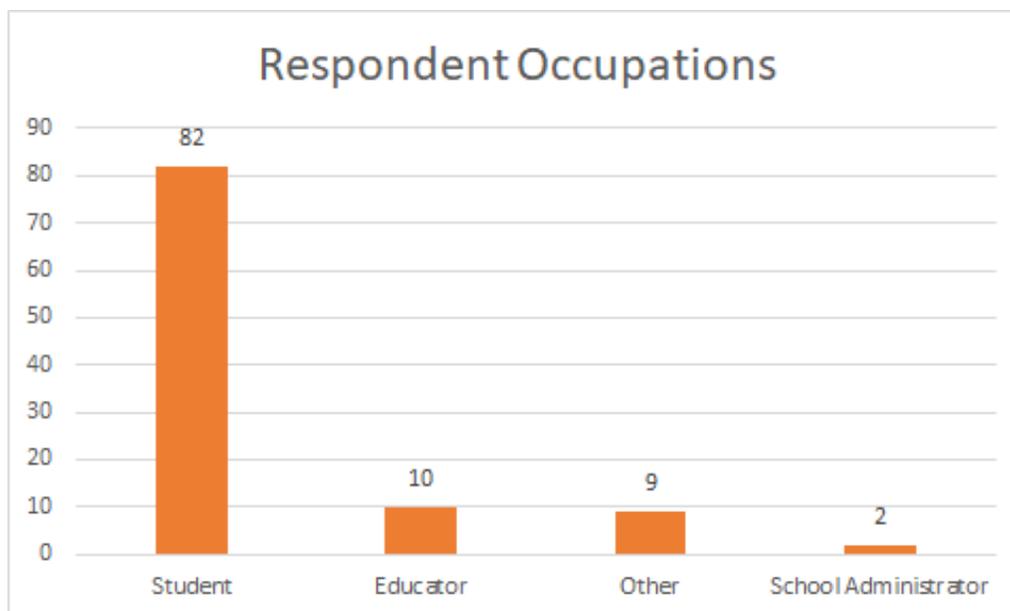
Figure 13: A breakdown of the roles of survey respondents (n=103).

This does have an effect on the survey results, skewing towards the typical responses of the younger ages, however analysis accounting for the age groups is still useful.
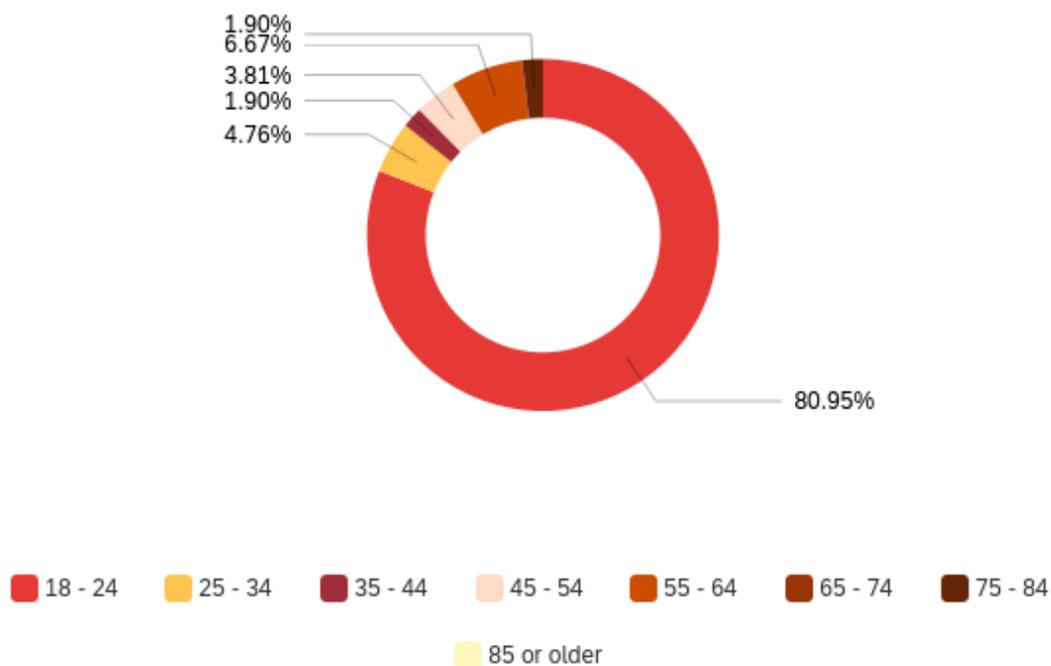
Figure 14: A breakdown of the ages of survey respondents (n = 106).

RESULTS AND DISCUSSION

From our respondents, 43% of them are spending the most time on YouTube, 23% on TikTok, 20% on Instagram, and 13% spend the most time on Facebook. It is important to note that these results can be skewed by the average age of respondents, as well as the average length of video, with YouTube videos being longer than the other options.
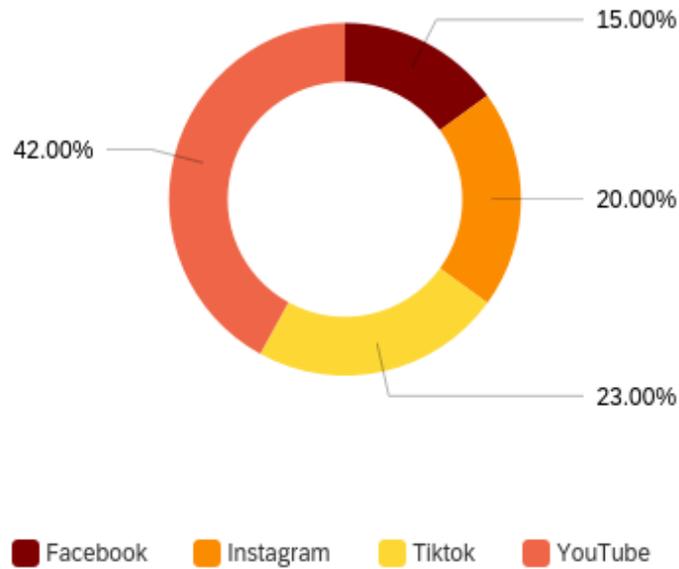
Figure 15: Survey results on which media platform respondents spent the most amount of time on (n= 100).

Each day, 44% of respondents spend 1-2 hours on Instagram, Facebook, and TikTok, while 27% spend less than an hour, and around 20% spend 2-4 hours.
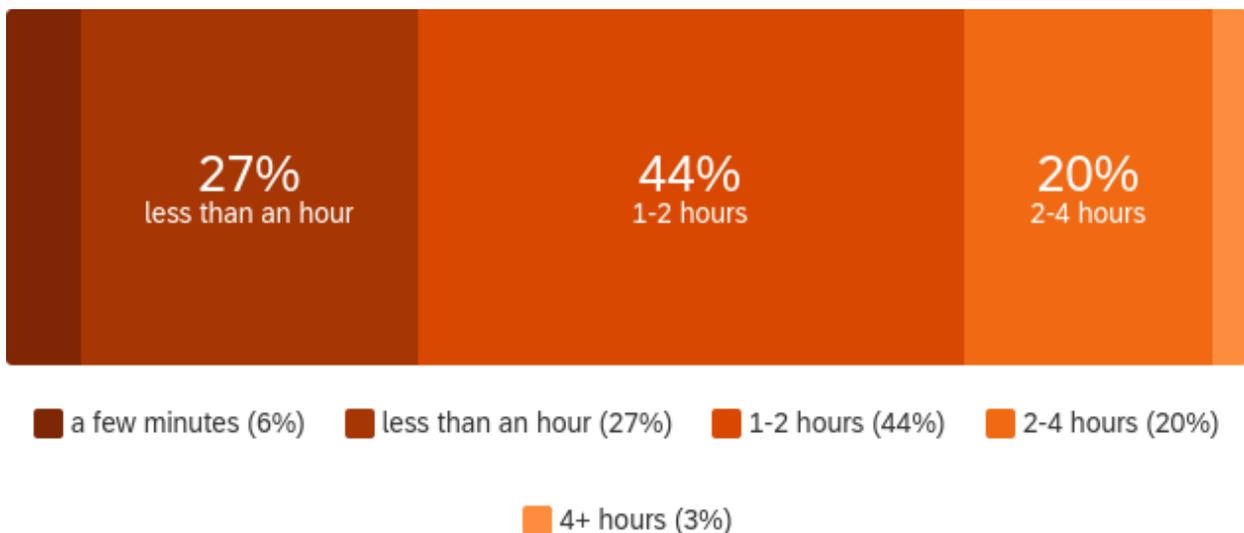
Figure 16: Survey results on the amount of time spent on social media per day (n=100).

More importantly, the breakdown of most time spent on a platform varies by the age group of the respondent, as shown in Figure 17. The older respondents spend more time on Facebook than other platforms, while the younger respondents spend the most time on YouTube, TikTok, and Instagram.
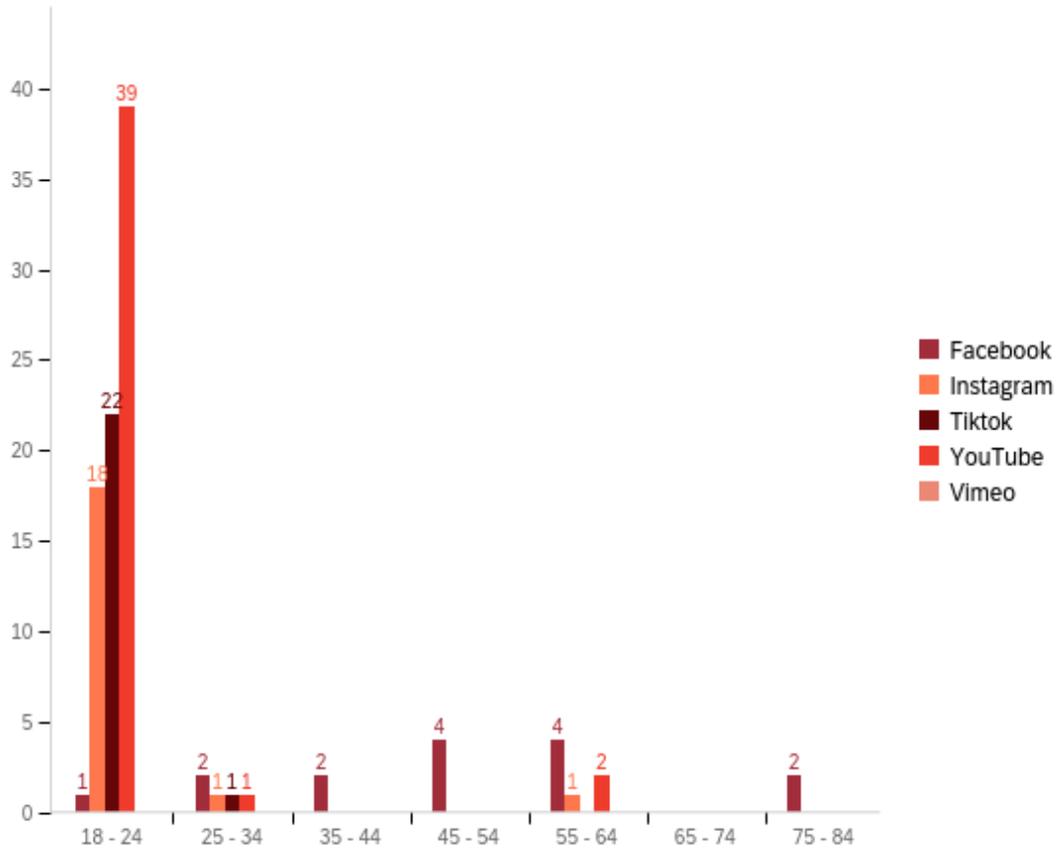
Figure 17: Breakdown of which platforms different age groups spend the most amount of time on (n=100)

The preferred method of watching music videos also varies. According to Table 4, the choices ranked in order are YouTube, Instagram, TikTok, Facebook, Vimeo, and Other. With 88% of respondents ranking YouTube first, it is important to note that they are going to YouTube to watch videos, and that other social media platforms can be leveraged to funnel viewers to a curated YouTube channel.

Table 4: A breakdown of platform rankings, ranked 1-6 (n=100).

Field	Mean
YouTube	1.18
Tiktok	3.24
Instagram	2.85
Vimeo	4.45
Facebook	3.78
Other	5.50

Survey respondents also viewed very few live streamed concerts, with about 50% watching no live streamed concerts this year. Only 15% of people have viewed more than two live streamed concerts, and only seven respondents had watched five or more (Figure 18).
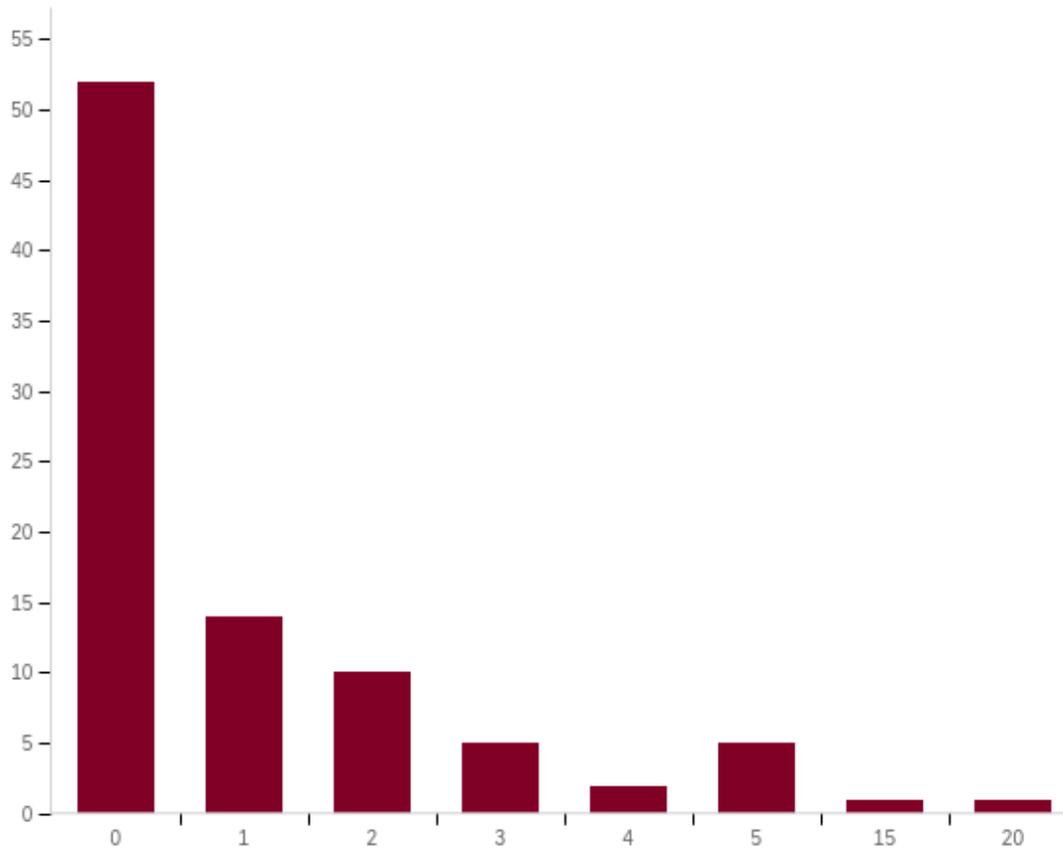
Figure 18: A chart of the number of times respondents have watched live streams concerts (n=100).

Respondents were asked to rank important qualities in a live stream on a scale of one to four, with one being most important, and four being least important, as shown in Table 5. Eighty-seven respondents ranked sound quality as most important, with video quality, video content, and entertainment value falling in behind.

Table 5: A chart showing the rankings of important live stream qualities (n=87).

Field	Mean
Sound quality	1.60
Video quality	2.59
Video content	3.20
Entertainment value	2.62

Upon examination of twenty responses of the educator survey, it was noted that it was relatively equal whether or not a school had brought in outside educators during the pandemic, with nine responses of "yes", and eleven responses of "no", which is much greater than the expected amounts (Figure 19). These virtual educational programs included assemblies, workshops, museum exhibits, authors visits, science programs, a marionette show, and a MasterClass on playing the recorder.

45% Yes	55% No

Yes ■ No ■
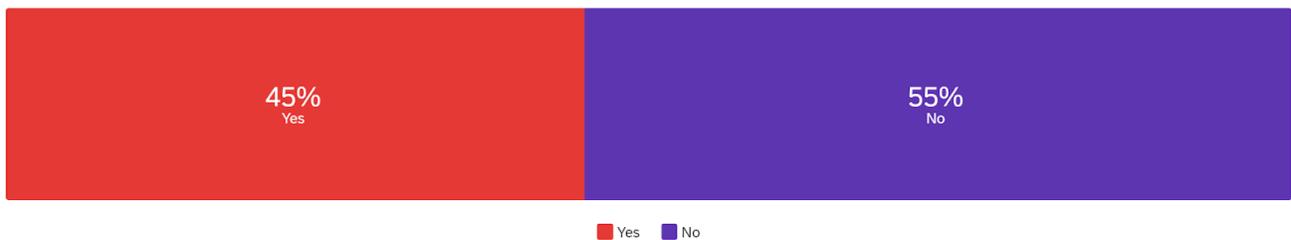
Figure 19: A chart detailing the percentage of schools that had outside educators visit during the pandemic (n=20).

These educators also noted that although they recognized the usefulness of virtual performances, they overwhelmingly preferred an in-person performance with unanimous support for it. Reasons cited for virtual included cost, attendance, manageability, and across-classroom sharing, while reasons cited for in-person included physical energy, less screen time, and virtual tiredness.

Table 6: Ranking of virtual program timing from 1-7, in minutes (n=20)

Field	Mean	Std Deviation
1-2 mins	5.38	1.73
2-5 mins	3.63	1.49
5-10 mins	3.13	1.62
10-20 mins	2.94	1.30
20-30 mins	2.88	1.62
30-45 mins	4.00	1.87
45+ mins	6.06	1.71

Survey respondents also ranked the ideal length of time for a virtual program from one to seven (one being best, seven being worst). The lowest average ranking was twenty to thirty minutes, with an average ranking of 2.88, as shown in Table 6. The second-best choice was ten to twenty minutes, with an average ranking of 2.94. Virtual programs must be efficient, and no longer than thirty minutes to be effective.

RESULTS AND DISCUSSION

Objective 3. **Identify Areas of Growth and Development for CRM's Online Presence**

Discussions with members of CRM revealed that most were willing to contribute to developing content for online use, even once in-person performances are a possibility again. The musicians see online production as a way to reach students anywhere in the world; the possibility of an online program removes the difficulty and expense of traveling. According to one member of CRM:

> *We want to try to be out and also able to perform from here while sitting in New England...be able to teach in France or maybe Germany or something like that. We definitely want to keep working on that* (Participant 1, personal communication, April 16, 2021).

The musicians are absolutely willing to dedicate effort into expanding their online presence, and think it is valuable to do so, despite the difficulties of creating video content. In an interview with the musical director of CRM, for example, we learned that it takes about 8 hours of work to produce one five-minute video (Participants 1 & 2, personal communication, April 16, 2021). Even given this vast time commitment, the enthusiasm to push forward and continue to share music is present at CRM, which is one of the most important components of success in any endeavor.

To further gauge areas of improvement, we conducted a virtual site assessment focusing on Crocodile River Music's online presence. After investigating the state of the website, we identified areas that could be updated and then subsequently learned that CRM plans to update the website. Therefore, we focused instead on the social media platform activity used by CRM, including Facebook, Instagram, and YouTube. Below, Figure 20 illustrates the number of followers CRM has on each of the three platforms, as well Twitter.

Comparison of CRM's Current Social Media
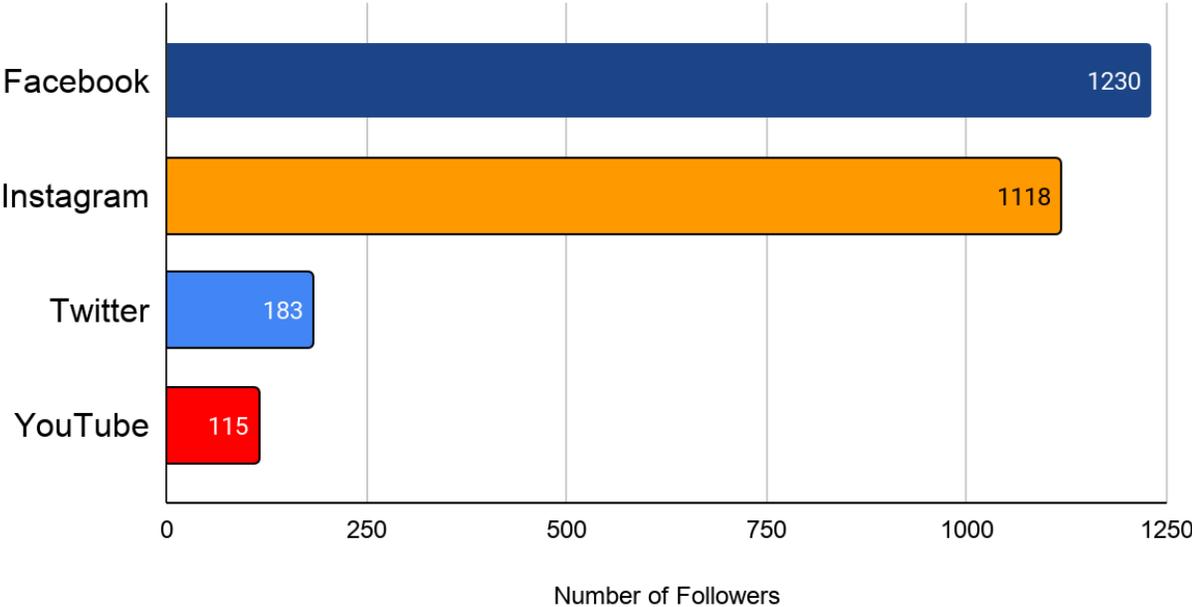
Figure 20: The number of followers associated with CRM's social media presence.

Facebook and Instagram

Crocodile River Music's most popular platforms, Instagram and Facebook, are also the ones that are used for promoting CRM and are the platforms where most of their effort is focused. There are regular posts on both platforms, occurring approximately on a weekly basis (Crocodile River Music, 2021b; Crocodile River Music, 2021c). Currently, the Facebook and Instagram page are being used effectively to promote their digital residency program and other online content. The Facebook and Instagram pages are illustrated in Figures 21 and 22, respectively.
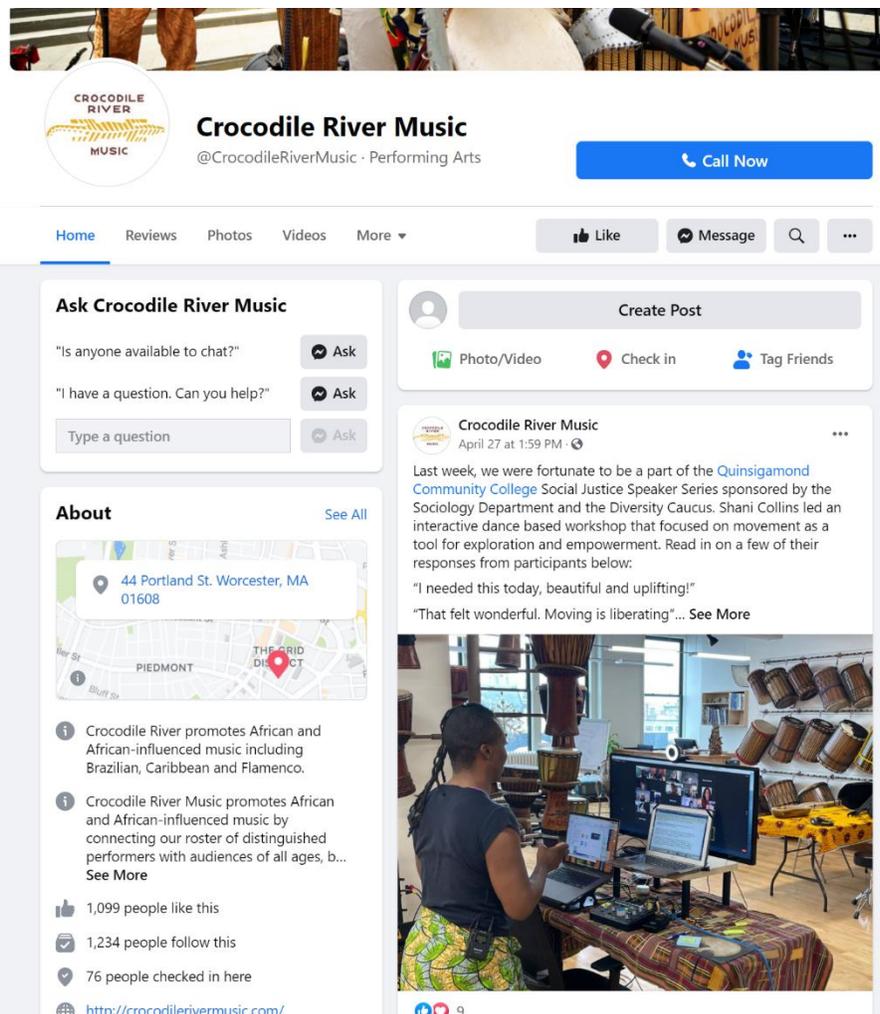
Figure 21: Crocodile River Music Facebook Page (Crocodile River Music, 2021c)
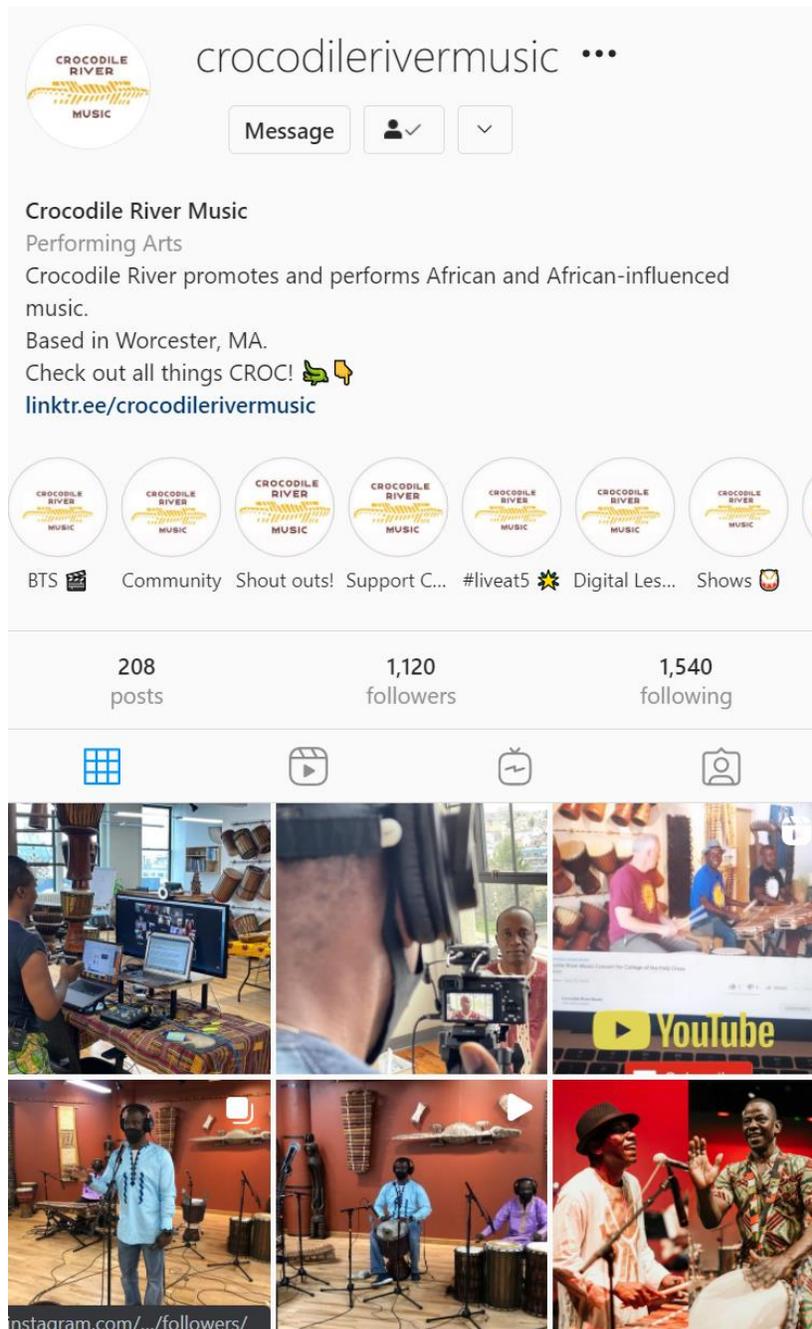
Figure 22: Crocodile River Music Instagram Page (Crocodile River Music, 2021d)

As a part of our research, we connected with the CRM social media team and asked them to conduct several Instagram polls. These polls were simple questions about various aspects of CRM's online offerings. We noticed that despite CRM's over 1000 followers, there were very few responses, often numbering in single digits. Nevertheless, the questions offered some insight into using the poll service to assess audience preferences. The poll results are posted below in Figures 23-25.
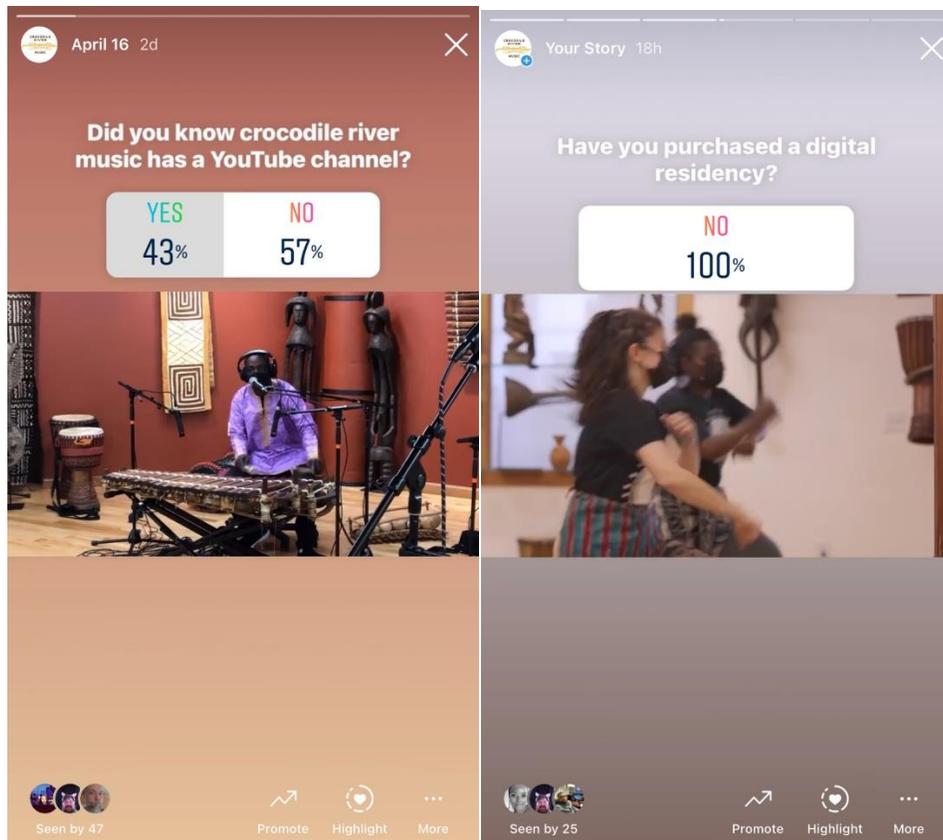
Figure 23: Instagram story poll results
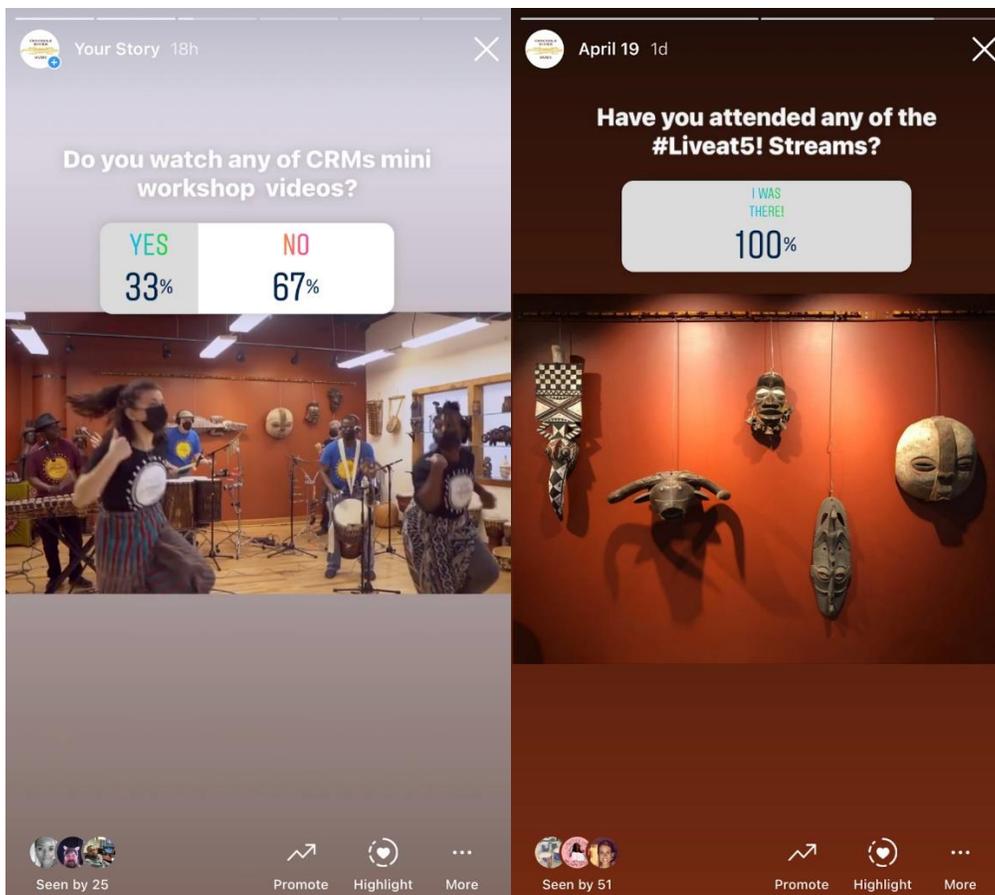
Figure 24: Instagram story poll results
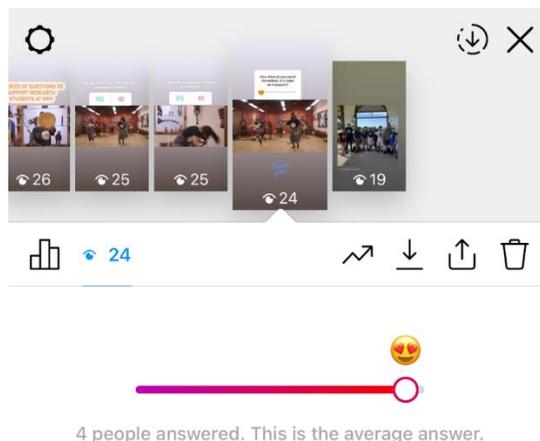
Figure 25: Instagram story poll result from question: "How often do you watch the entirety of a video on Instagram?"

YouTube

The CRM YouTube page (Figure 26) is mostly used as a place to archive their recorded live content, which are typically about twenty minutes long. Also available on their YouTube channel are shorter, roughly 2-minute videos, which focus on highlights and promotion of their other content.
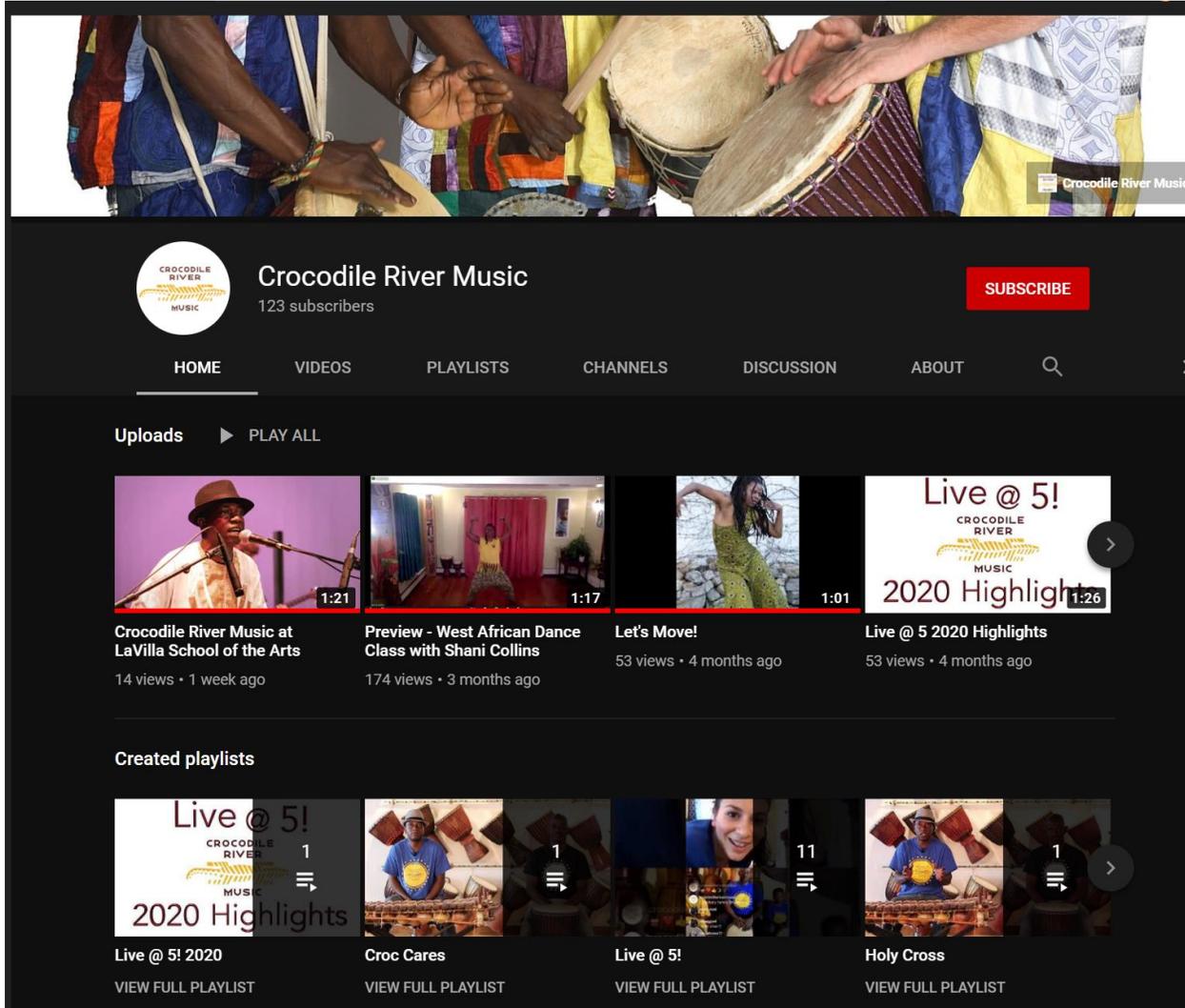
Figure 26: CRM YouTube Channel (Crocodile River Music, 2021e)

We found that their YouTube page was lacking clarity. There was no sample video on their YouTube page, so it was confusing to know what to watch first as a newcomer to the channel. Instead, the user is simply presented with a list of videos with vaguely descriptive titles. They have a welcome video, but it is buried in the list of other videos and not obvious as something to watch as someone new to CRM.

RESULTS AND DISCUSSION

Crocodile River Music Website

Our virtual exploration of CRM's website found that it does a great job of promoting them, with lots of relevant pictures and details about their organization and artists. The design of the website is relatively easy to navigate, with a clean appearance and finding items is a trivial task. Figure 27 shows the home page, with the menus at the top.
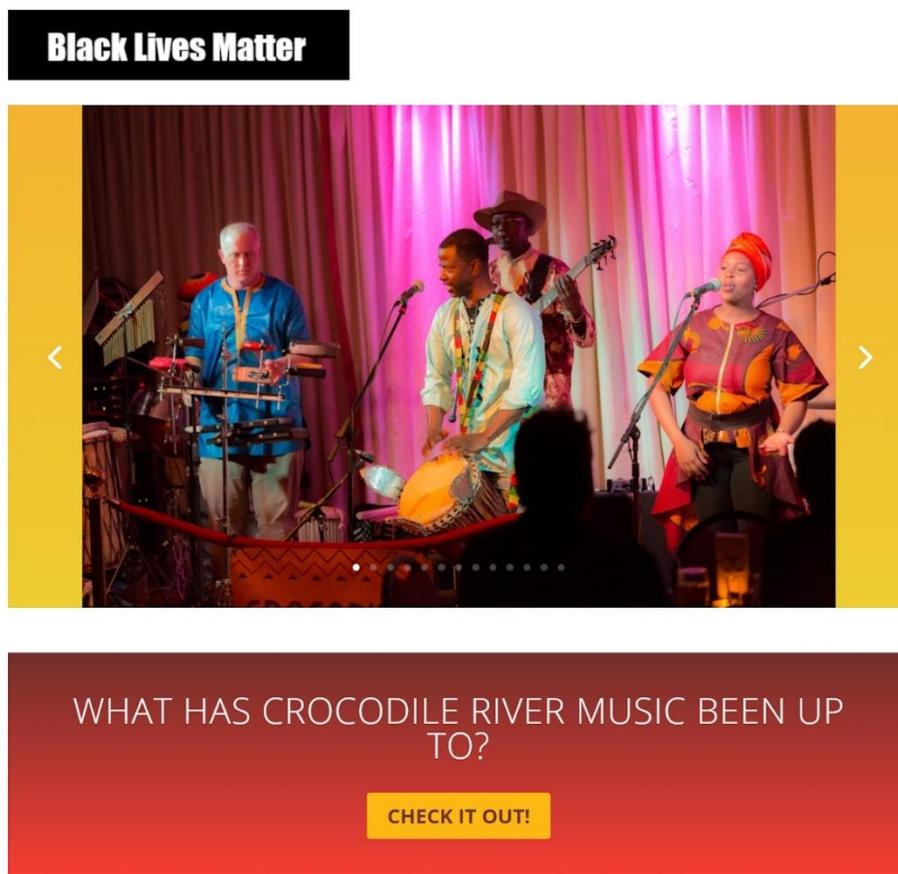
Figure 27: Crocodile River Music home page (Crocodile River Music, 2021h)

While the website itself is clear, much of the information is outdated or unclear, such as the digital residency program, which still states that it is available until the end of 2020 (Crocodile River Music, 2021g). Since this program is CRM's primary educational offering, it is crucial that the website is clear on the details, so that potential customers are not confused.

The digital residency program is presented in a list format, as shown in Figure 28 below. While this list provides a great description of the offerings in the residency program, and the welcome video does a great job of introducing the program, there is no sample content linked in the list. That means that there is no way for potential customers to sample the product before they receive it. Additionally, there is no way to directly purchase the residency. Instead, there is simply a large "Contact Us" button at the bottom, requiring the person purchasing the residency to email Crocodile River Music in order to receive the program (see Figure 28 below) (Crocodile River Music, 2021g).

CURRICULUM	Get ready to….
" Welcome Video" – From The CRM Team	Observe And Enjoy!
"Bani Performance" With Balla, Issa, and Zach	Observe And Enjoy!
"Koton Kar Kar" Rhythms With Balla	Play Along With Cup, Spoon
"Hands in the Air, Feet on the Floor!" Dance With Charlotte	Move Your Body!
"The Big, the Bass, and the Powerful" Dun Dun With Issa	Play With A Bucket & Spoon
"Hunter Games" Berimbau With Che	Clap Along!
"Gourds, Trees, and Animals" West African Instruments With Meredith	Dig Deeper!
"Come Together in Peace" Djembe With Issa	Clap Along!
"A Man, a Hat, and His Bass" Mbalax Music Lesson With Thierno	Find A Perfect Instrument
"Inside the Collection: A Look at Crocodile River Music's Art" With Meredith	Dive Into African Art!
"Everything but the Kitchen Sink" Rhythm Exploration With Matt	Drum With Bucket, Cup, Bowl
"Hello, Come Play With Me!" Jambo Sing Along With Wangari	Use Your Voice!
"I Say This!" N'goni With Zach	Learn About The N'goni!
"Not So Fast Songololo" Storytime With Wangari	Sit Back, Relax And Listen!
" Mother and Water: Keys of Life " Balafon With Balla _Sosso Bala Link_ and _Building the Balafon in Balla's Hometown Link_	Explore The Balafon!
" Peoples Behind the Masks" West African Mask Research Guide Meredith Combs of Simmons University, School of Library & Information Science	Explore Masks!

LEARN MORE

CONTACT US

Figure 28: Digital Residency Presentation (Crocodile River Music, 2021g).

After reviewing the website and interviews we conducted with CRM staff, we developed a Strengths, Weakness, Opportunities, and Threats (SWOT) analysis, presented in Figure 29 below. Crocodile River Music as an organization has a lot of talented, motivated, musicians, who are willing to put their efforts into producing digital content, and they certainly have a great opportunity to establish a strong online presence. To leverage these strengths, they will need to overcome the difficulties of

producing videos, achieve more interactivity in their online teaching, and be able to effectively promote themselves.

Strengths
- Uniquely talented musicians with extreme skills
- Enthusiasm for having online content among team
- Many dedicated team members wanting progress
- Recording space where everyone can meet together
- Creative ideas for engagement in the digital residency

Weaknesses
- Library of videos is not easy to find
- In order to purchase digital residency, you contact CRM
- Videos take a long time to produce
- Interactivity is difficult in a virtual class
- Audio quality in videos isn't great
- Promotions on social media do not have a good place to lead to

Opportunities
- Capitalize on the return to in person concerts
- Audiences now more open to virtual concerts
- A global audience is available
- Tik Tok
- Facebook/ Instagram advertising
- Everyone knows how to use Zoom
- Becoming a nonprofit

Threats
- In-person concerts less desired than before
- Uncertainty about the pandemic's duration
- Reliance on educational funding and grant

Figure 29: SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis of CRM

Part 2. Discussion

Several clear trends emerged from these findings. It seems that it is best to approach the problem by exploring alternative ways that musicians can use their talents in a virtual setting. These methods can be used either as a replacement, or as a supplement to live concerts. The additional avenues of growth include branching out with options like private or small group lessons, Master Classes, and other educationally focused lectures or artist talks that do not rely on having a large audience. As

with anything virtual, the benefit is that the lessons and classes have the potential to reach a global audience, and do not rely on proximity to students. Some modules can even be pre-recorded.

From our interviews with the members of CRM, we established that there is a unified desire to expand the reach of the organization to a broader geographic area. Given the nature of virtual performances, classes, and lessons, there is no barrier for CRM to expand their audience globally, which cannot be said of in-person performances. Getting to that option will require some strategic investment in time, outreach, and equipment.

Crocodile River Music can refine their production processes, and several pieces of equipment can help with this task. Given that they already have a lot of professional gear, it is important that any recommendations do not replace what they already have, but rather supplement their existing production process. Therefore, we have highlighted only items that could add to their existing setup, as opposed to items that would replace equipment they already have. Most of the advice we received during interviews indicated that familiarity and comfort with technology is better than pure optimization, and most pieces of software and equipment have comparable features, so there is no clear "best" option. Given that the focus is to streamline the production process, learning new software for editing, or entirely renovating the studio CRM already owns would be counterproductive. As Professor Bianchi puts it:

> *I tend to bury my head in the sand and not look elsewhere 'cause I'm afraid I'm going to find something better and I'm going to have to make the adjustment"* (F. Bianchi, personal communication, April 8, 2021).

This is not to say there are not better devices that CRM could use, but the technical buy-in for switching software is high and we found it to not be worth the investment at the moment.

The most significant challenge facing CRM with regard to production is simply the sheer amount of time it takes to produce videos. While a lot of time can be saved by using new technologies, the process itself can be refined as well. As stated earlier, CRM musicians can spend up to eight hours producing a single five-minute video, and while there is certainly some time investment involved, it does not need to be that lengthy. Brett Maguire, a music production professional, describes his philosophy here:

> *I have a rule that I think it was the 80/20 rule. You can spend the effort to get something to 100% like a plus. It's awesome. The lighting is great. The sound is great. Everyone's doing their stuff memorized. Um, maybe 80%, the lighting's not [sic] great, but it's good enough that you can move on. It's like, yeah, if we had more time, if I had one more person, I could do something. But identifying what that 80% is, that's good enough to then*

move on is something that I found hugely useful (B. Maguire, personal communication, April 20, 2021).

This piece of advice is really important for any creative to consider, especially when there is financial opportunity at stake. CRM may be spending a lot of their time trying to get every detail right, which significantly increases the time it takes them to produce content. As we know, the key to engagement is keeping and adding followers that will support your art.

Through interviews we had with musicians producing virtual content, we learned the role that social media can have in gaining a larger following, in promoting CRM as an entity, and in advertising both their concerts and also their virtual courses. TikTok offers new opportunities for publicity and a diversity in audience age group that augments the followers generated by Facebook and Instagram. The important aspect of creating content for TikTok or other platforms is to funnel prospective clients to a place where they can then purchase tickets or longer videos (W. Hall, personal communication, April 22, 2021). For example, the funnel locations can be other social media platforms or the website. The time it takes to produce a TikTok video is significantly less than that of a YouTube video - ideally about 30 minutes or less to record and edit. Therefore, TikTok has the potential to be a quick way to advertise CRM and draw in fresh interest.

An important side note discussed across many interviews, was how even after all the editing of a video, and trying to produce the best sound quality, the audience may not even have the best speakers. Professor Manzo explains his fears with producing music:

> One of the things that always scares me about producing music is that I never know who is listening on the other end and what their gear is and so if you ever recorded yourself performing or done something like that, you know, you put this thing out there and you hope that someone is listening with headphones or on good speakers but most often, you know, you see people who like play it off on their little phone speaker (V. Manzo, personal communication, April 9, 2021).

This quote just shows how even after all the work put into producing music, all the work can easily just be erased by the audience listening to the music on their own terms. It is important to keep this in mind when producing content, not to be discouraged from doing so, but to not waste time on curating high-quality videos on a platform that is just used as an advertisement to draw in a customer base for more dynamic performances or lectures.

With the several interviewees discussing the use of their platforms, many pointed to the quality and the lagging of sound and are dissatisfied by using them for virtual live performances. Professor Buono (WPI), discussed his feelings on virtual performances:

> *There's a difference between recording a performance that's meant to be consumed as, for example, a music video versus playing in a sterile environment where you're not actually live with the other musicians, or there's no audience, or the musicians' recordings are not even recorded in the same environment. To me, music production can capture a sonic environment that adds to the realness of the experience, but remote "live" performances lose that dynamic, captivating environment and feel kind of boring. I think the pandemic has shown that there's a big difference between the two* (P. Buono, personal communication, April 7, 2021).

This dissatisfaction from virtual live performances can also be observed with the survey. When respondents were asked if they would be willing to continue to watch virtual live streams after COVID-19 restrictions have been lifted, and even though many had said yes, it was also noticed that those that said no were mostly explaining that being at an in-person concert had just vibe or feeling that was lost through virtual concerts. Even those that had said yes, some had mentioned that it would be a convenience if there were still virtual concerts, as long as it were cheaper or if the concert was too far away to access. This speaks volumes and shows that after restrictions are lifted, virtual concerts should not be relied on, and should be seen more as an additional add on.

With these points in mind, producing high quality content should be featured on high quality platforms, and not across multiple sites. Zoom and YouTube seem to be the most used platforms for this purpose, which lends itself to what CRM is already using. An interview with Charlotte Rosen, a dance instructor from CRM, discussed the use of Zoom using a hybrid model, with some prerecorded music and then a live Q and A in a few workshops (C. Rosen, personal communication, April 22, 2021). This model appears to work well, as a few other interviews included discussions of similar strategies. However, a platform that serves as a library of music performances or videos would be YouTube. This platform is free and allows for easy storage for high quality videos, but due to the complex algorithms of YouTube which make it very difficult for lesser popular accounts to have videos viewed, it is important to still use other social medias to lead the way into viewing content on YouTube.

In conclusion, the data shows that there are ways to engage with audiences virtually, but virtual performances can never be a replacement for live ones. In order to have a successful virtual program, there must be a clear purpose for the content being produced, effective promotion, and some interactivity to keep students engaged. But most of all, CRM needs to adapt strategies which make producing virtual content easier and faster for them, otherwise the time investment will be too significant when compared to live concerts. If making videos continues to be a long and difficult process, the desires for virtual education and global outreach are in danger of being abandoned as venues and schools start to open up and CRM can return to their original programming.

Chapter 5: Recommendations and Conclusion

Our discussions with experts, artists, and audience members and analysis of our data have led us to a list of recommendations that we feel will benefit CRM as they build resilience to unpredictable events such as the COVID-19 pandemic.

We have separated them into three categories: Product, Process, and Promotion, with associated steps for building capacity in each domain.

Recommendation 1. **Product Improvements**

Focus on pre-recorded content

We recommend that Crocodile River Music focus more on pre-recorded content rather than live streaming. This is in response to the number of views pre-recorded content receives compared to live streams and CRM would be more efficient with their time if they put more of their focus towards one type of virtual content rather than both at once. Furthermore, these videos would do best if posted on YouTube and then shared across the other social medias. This way, CRM creates one location for video content, making it a standard, stable, and reliable platform for fans and for audience reference.

Repurpose live streaming

We recommend that Crocodile River Music refocus its use of live streaming content. Instead of seeing live streaming as a way to outright replace live concerts, it can be used as a more targeted way to gain more views with existing in person performances. This is because it appears that audiences would already prefer in person events rather than virtual live streams but will still use it if the event is too far away.

Reach out to Mark Mummert at Trinity Lutheran Church in Worcester if CRM is interested in live streaming a concert. They have the equipment and set up for live streams and seemed interested in a possible collaboration. Even if CRM is not interested in collaborating, this is an opportunity to learn more about professional live streams, so we recommend they explore this option for the purpose of developing skills. Mummert is the Cantor at Trinity Lutheran and is responsible for their music programing. Here is a link to his webpage.
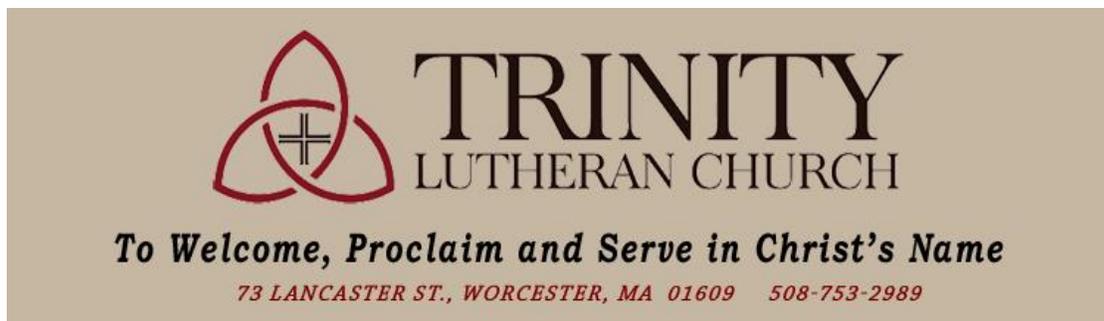
Figure 30: Trinity Lutheran Church address and contact information

By live streaming concerts CRM has the ability to share their music globally but at this point in time it is not necessary to invest in live streaming equipment. Once CRM gains a very large following it would be beneficial to revisit live streaming.

Expand the format of virtual offerings

We suggest CRM continue to use a combination of Zoom and pre-recorded videos for teaching remotely to schools. CRM can instruct students to view pre-recorded videos prior to zoom sessions. This will allow the students to hear the original audio without it being compressed or buffered by zoom. For interactive lessons, we suggest continuing to use Zoom, as it is the most widely accepted and recommended way to conduct instruction online.

To increase interactivity during classroom sessions, consider using or creating a virtual drum pad so that kids can follow along during online classes. The way these drum pads work is pretty simple: there is an image of a drum, and when a user clicks a section of the screen, they hear a drum sound. This would allow for students without drums to participate. One example of this is an online virtual drumming website (Virtual Drum Link) (Figure 31).

Figure 31: Screenshot of virtual drumming website

To make the experience more engaging with students, use breakout rooms in which smaller groups of around five students can talk directly with the musicians. Interactivity is extremely important in virtual learning, so make sure to emphasize activities where there can be discussion/dialogue or following along. This model does require a larger number of musicians and dancers to participate in workshops, or a smaller classroom size to be effective. The most important element identified in our survey to educators was the question and answer sessions which allowed for the level of interactivity that engaged the students.

For local schools, there is a desire to return to in person workshops but developing the infrastructure and knowledge to conduct virtual workshops provides CRM flexibility in scheduling and the opportunity to reach a global audience.

Recommendation 2. **Process Improvements**

Invest in and make use of equipment that supports Crocodile River Music's video recordings.

We have compiled a list of audio equipment and have categorized it into three different levels, depending on the production application. Some types of content do not require a full studio to produce, so Table 7 provides a guide for which equipment to use, based on what types of videos and other media are being produced.

Table 7: Recommendations for different levels of studio equipment based on the intended application

Levels	Equipment	Application
One	Smart Phone Movo VXR10 Microphone ($40)	Short promotional videos posted to Instagram or TikTok
Two	One stereo microphone Audio interface 2i2 audio interface ($230-$300)	Higher quality audio for situations to record one person speaking or playing an instrument solo.
Three	Microphone for each instrument Acoustic proofing in studio Large audio interface	Best quality audio for high production concert recordings

We recommend that CRM invest in level one equipment for now because the Movo microphone interfaces with both smartphones and DSLR cameras. Therefore, it can be used for social media posts and digital residency recordings. If there is the budget to invest in level two equipment we recommend purchasing a higher quality microphone and audio interface because this will improve the audio quality of the educational videos. As for level three, CRM has most of the equipment already, and it is a necessity for recording ensembles of any kind. Because of the difficulty of managing the various components, it should only be used when necessary.

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To improve video production quality, consider using multiple cameras to obtain more camera angles. An HDMI switcher can be used to switch between the two or more cameras during recording, without the need to edit the two shots after the video has been recorded. Although CRM has multiple cameras already, they are not identical, which likely causes difficulty when using them concurrently, and requires the camera operators to understand multiple types of cameras. By investing in a set of identical, easy-to-use cameras, CRM can lower the technical understanding required to produce videos and streamline their process. We recommend purchasing two $400 Mevo Start Cameras, which provide a simple, yet high quality way to record videos with multiple shots.

The last recommendation we have for this section is to invest in quality sound proofing for the studio. We have found two websites that produce aesthetic soundproofing options: Auralex and GIK Acoustics. Auralex sells more traditional sound absorption tiles (Figure 32).
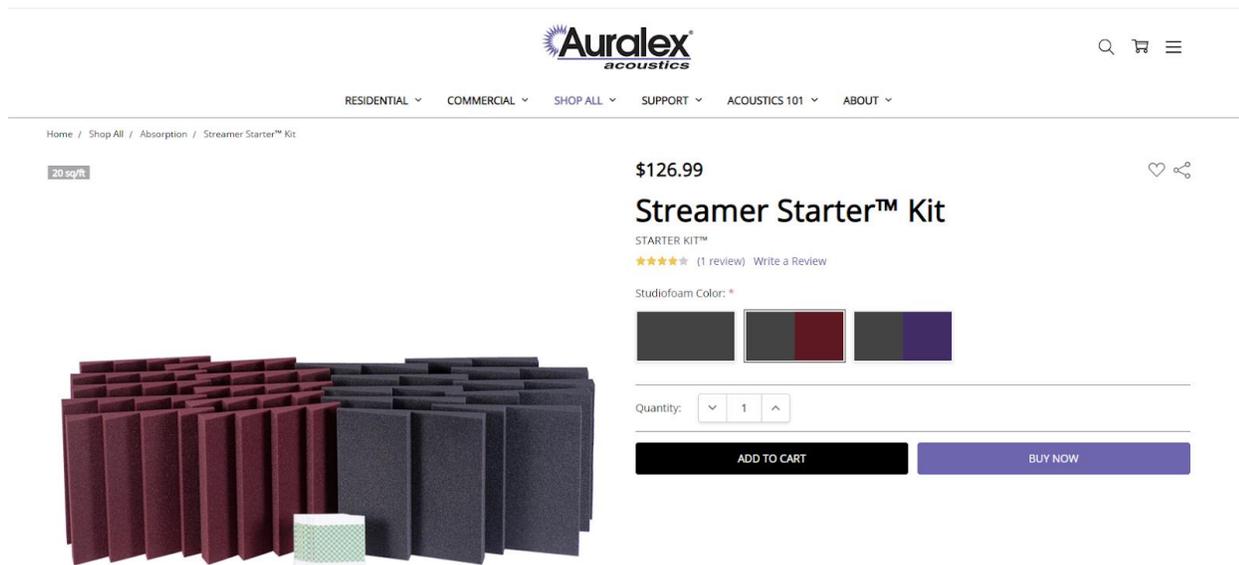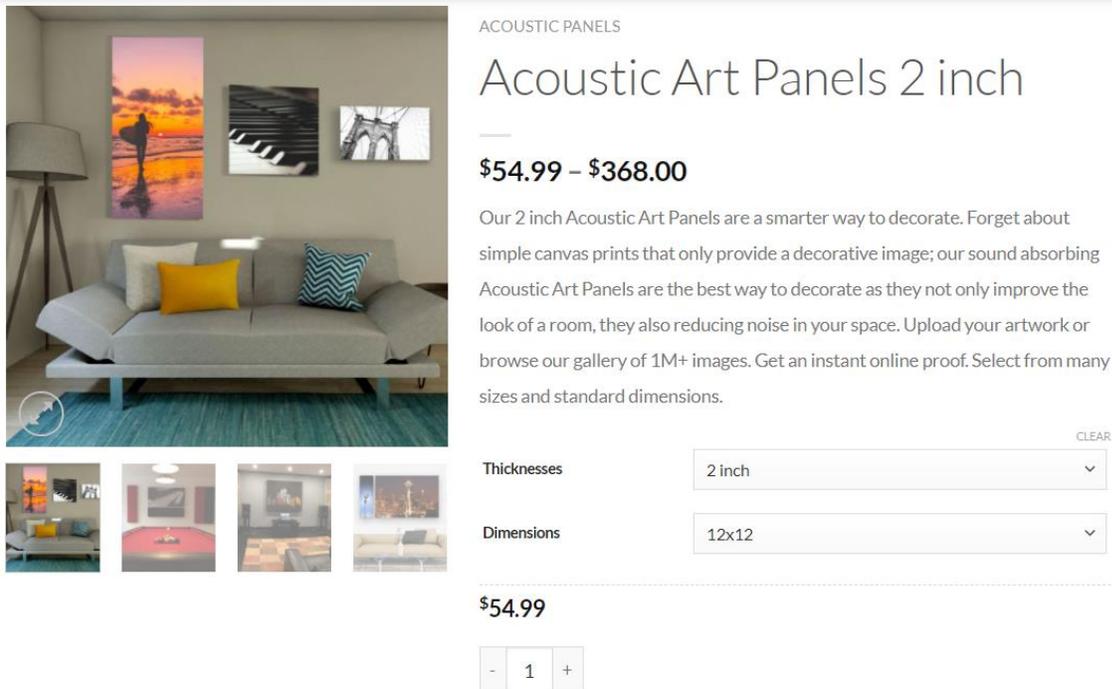

Figure 32: Auralex: Link to simple decorative panels

Whereas GIK Acoustics provides customizable tiles that can have images printed onto them (Figure 33).

Figure 33: GIK Acoustics: [Link to 2" thick customizable panel](#)

Soundproofing the space is important in reducing the echo of the music that can be picked up by the microphone. These options both look good on camera and improve overall audio quality. We recommend that CRM invest in Auralex for general soundproofing because it is the cheaper option. For areas that will be included in video recordings invest in a few of the more artistic soundproofing options offered by GIK Acoustics.

By investing in the aforementioned equipment Crocodile River Music will be able to elevate their audio and video quality to a new level, which will give their videos higher production value then they currently have.

Continue using current audio and video editing software

Crocodile River Music already has a process that their musicians and audio engineering personnel are familiar with. Given the complex nature of editing software, and the amount of time it takes to learn to use it well, it does not make sense to change platforms unless a specific need arises. If there becomes a need for software with greater capabilities, Table 2 in the Results section provides a list of audio editing software offerings used in professional settings.

Streamline video recording process

The first step in streamlining video recording and production is the 80/20 rule. This rule states that videos should be worked on until they are 80% good. Therefore, the lighting does not need to be perfect, sound does not need to be perfect, in the case of music videos the notes do not need to be

perfect. The reason for this rule is to reduce the amount of time spent recording material, because the final 20% often takes significantly more effort than the value it provides. Determining when the 80% threshold is reached is a subjective matter and is therefore something that can only be up to the person recording to decide. We recommend designating a director for recorded content in order to keep videos consistent and determine when recording is complete.
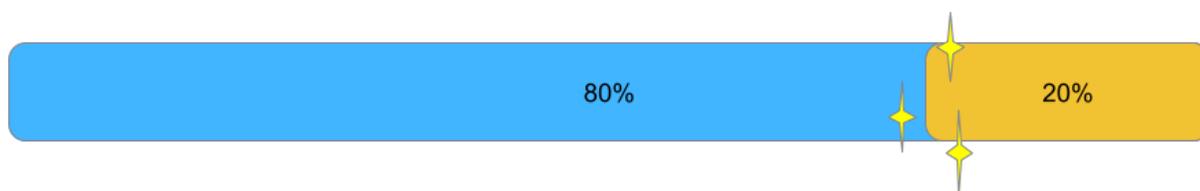
Figure 34: Illustration of the 80/20 rule

Through our survey we identified key components that people look for in virtual musical content. The most important part was audio quality followed by video quality. Entertainment value was rated similarly to video quality with the content of the videos being coming in last. These questions did not focus on educational videos but do reflect the importance of recording quality and for the recordings to be as engaging as possible.

Leverage online courses to help with course creation and video editing
Through our research we came across Parker Walbeck. He is a filmmaker who has created online courses teaching video recording techniques. He also has a course that outlines step-by-step how to develop and market online courses. We recommend looking into his methods and possibly investing in the courses if that is something CRM has the budget for. (https://www.parkerwalbeck.com/)
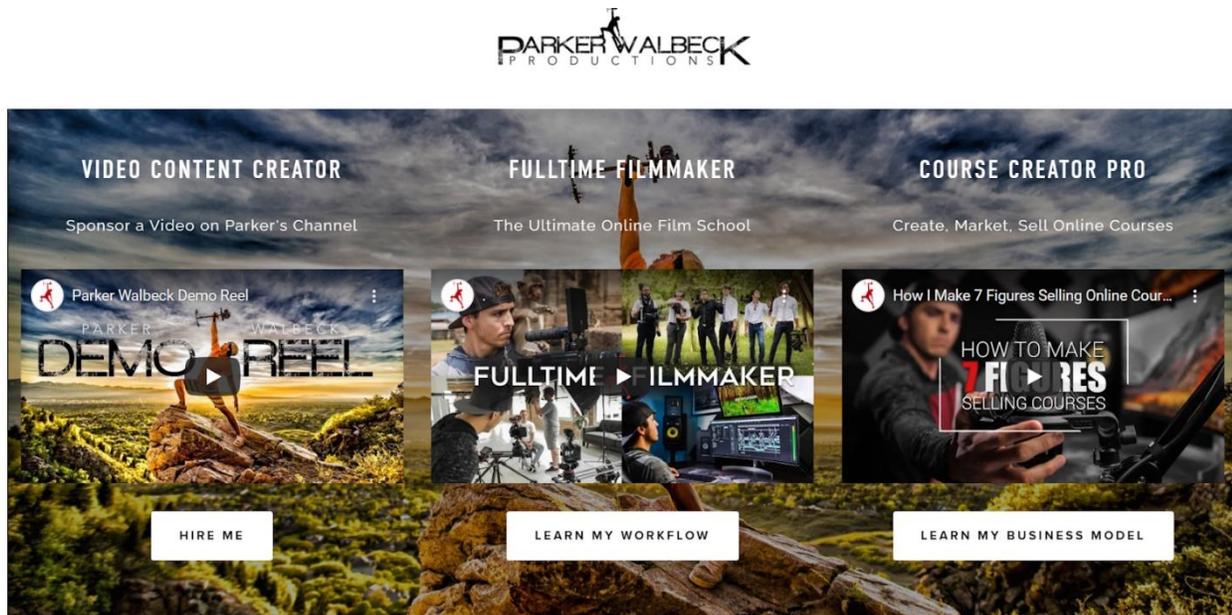
Figure 35: Screenshot of Parker Walbeck's website (Walbeck, n.d.)

Walbeck's course, Course Creator Pro, covers research, development, infrastructure, marketing, advertising, and scaling of courses (Walbeck, n.d.). It costs a flat fee of $997 which is a significant investment. Walbeck provides a one hour webinar where he talks about the top ten steps outlined in his course and provides a brief preview. Viewing this webinar would be an excellent place to start for CRM. Having step by step instruction on how to create an online course will streamline the process and remove the time spent on trial and error.

Recommendation 3. **Promotion Improvements**

Advertise Crocodile River Music using social media

In order for virtual content and in person events to reach a wide audience, it is essential for Crocodile River Music to promote themselves through social media. Since CRM has quite a large following on Instagram and Facebook, CRM should continue with posting on both of these. To encourage engagement with followers, CRM can investigate optimal times to post on both social media accounts. Generally speaking, the best time to post on Instagram is around lunch hour on Wednesdays (Moreau, 2021). However, posting after work hours on weekdays is a good time as well because as seen in the survey results, the majority of respondents used social media in the evening and night times. For Instagram stories, it is generally a good idea to post them late at night, as then they have all day to be looked at. Also, Saturdays can also be a good day to post stories. Also, be aware that Sunday is the least recommended day to post on social medias in general, as there is not as much engagement throughout the day (Moreau, 2021).
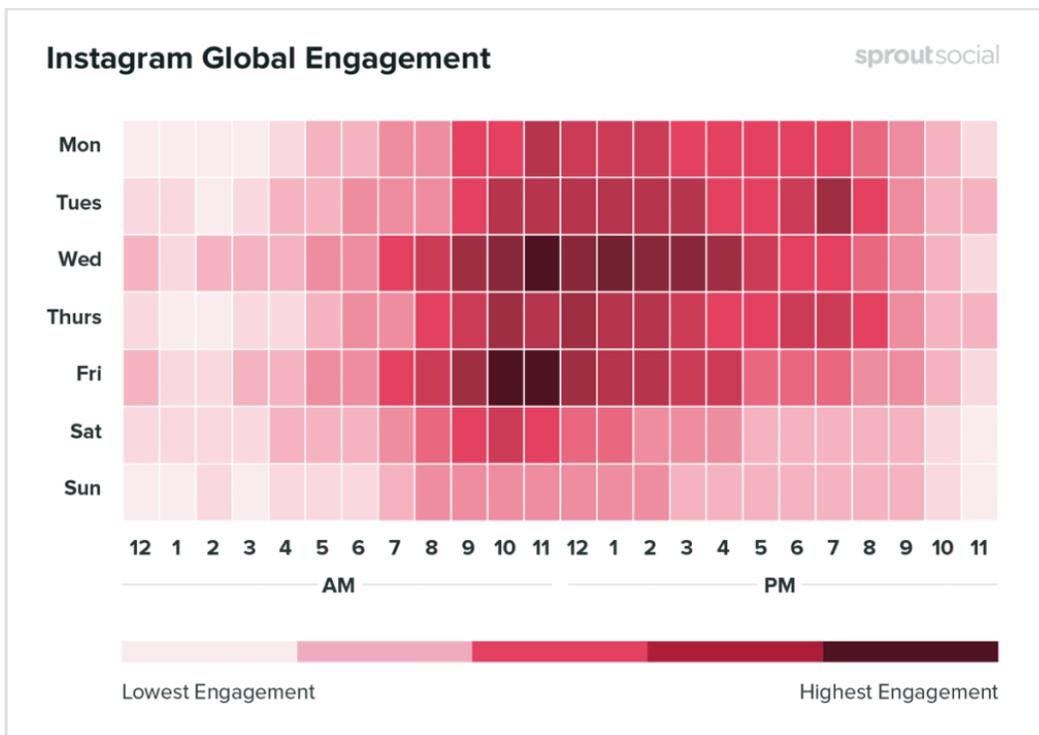
Figure 36: Average Instagram global engagement for everyday of the week (Inkbot Design, 2021).

However, to optimize post time even more so, there are platforms that can be used to analyze social media followings. By using the Instagram business account features, CRM can gain access to Instagram Insight, which is a good, free choice since it is within the Instagram app itself. Instagram Insight is straightforward to use and gives some basic information like how posts are doing and when your followers are online. Crocodile River Music can use this information to infer the best time for

posting. To take it a step further, there are companies out there that can do a further analysis. Two options are Hootsuite and Iconosquare. These applications both analyze Instagram and Facebook and can help plan posts in advance. They also both have user friendly ways to present data on your posts and provide recommendations to improve engagement on social media accounts. Both count options are around $50/month. These programs can be used in the future and are not essential now.

To reach an even greater audience on social media, Crocodile River Music can pay to promote their posts. There are two major demographics: the general public and educators. For educators, it would be best to use constant ads about CRM student workshops, showing customers offers for students. Ads on both Instagram and Facebook are optimal, but if budget does not allow it, Facebook should be prioritized. When choosing a post to advertise, using one which showcases a workshop is ideal. Lastly, these ads should lead people to the CRM website, where they further explore the offerings.

To reach a more general audience to promote performances, Instagram is a better choice to prioritize. Constant advertisement is not necessary for this, so it is recommended that advertisements are posted a few weeks in advance to a public event or workshop when reservations go live. Target these ads towards a wider age group but keep the area more localized and focus on reaching users with a higher interest in music. However, it is important to note that these ads should lead to CRM's profile page on that social media, where viewers can learn more about them and any upcoming events.

For a minor demographic, it would be great to make an ad for African musicians in the Massachusetts or New England area. This is to help bring in musicians to feature on CRM's platform, as it appears to be a part of CRM's mission, but only do this when needed. These ads should also lead to CRM's social media profiles. The table below summarizes the breakdown of advertisements.

Table 8: Social media advertising

Target Demographic	Educators	General Public	African Musicians
Where Advertisement Posted (at least)	Facebook	Instagram	Instagram
Directs Users To:	CRM Website	Profile and Event Bookings	Profile
When to Advertise	Constant	Before Events	When Recruiting

RECOMMENDATIONS AND CONCLUSION

It is important to add that Instagram and Facebook ads are on a bidding basis, as in, there is not really a set price and more of, how much are you willing to spend for the ad compared to other businesses. Because of this, it is easy for this to become overwhelming, but it is important to remember that at any time, ads can be turned off on these social medias. The budget might be trial and error at first, so it is recommended that CRM begin by paying for advertisements on a daily budget. This allows the budget to not be spent too fast. Also, when it comes to the actual bidding, select manual bidding, as this can give more control on how much money is spent.

Crocodile River Music could also join some educational or music Facebook groups. This allows CRM to be able to connect with educators and musicians, and hopefully, may be able to get future customers. Some helpful groups for online education could be E-Learning in Music Education and Music Educators Creating Online Learning. One CRM member was excited for CRM to dive into topics of social justice, so a possible Facebook group to look into could be Reclaiming Education for Social Justice. These are just a few groups out of so many that can be found and are a very reliable system to create connections.

Creating and maintaining a TikTok account

To help with promoting, another recommendation is for Crocodile River Music to make a TikTok account. The purpose of this is twofold: TikTok is excellent at reaching a wide audience to promote their content, especially of younger viewers, and also allows CRM to share shorter educational videos which do not take an extraordinary amount of time to create. Although TikTok initially presents itself as a place for entertaining, silly videos, there are many successful TikTok creators that have achieved success by producing educational content, such as Wesley Hall's.
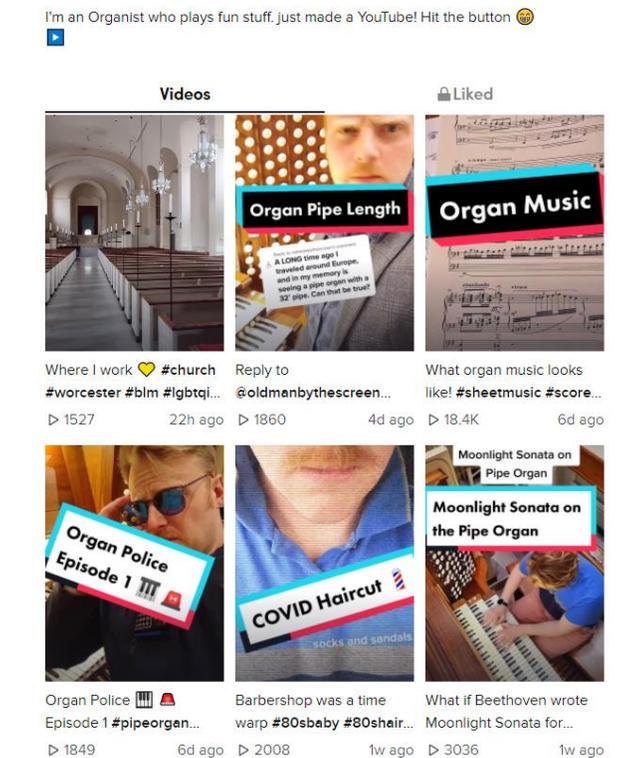
Figure 37: Wesley Hall's TikTok page (Hall, n.d.)

CRM could use TikTok by posting short videos about the different instruments or short snippets of the band playing a song, or even just practicing a song. Posts on TikTok can also be promotional to new content. For example, if a video or an event is occurring soon, and musicians are practicing for it, they could quickly record a short video of everyone practicing and post it with a caption stating when and where the event is. Since TikTok allows easy interaction with followers, CRM can take advantage of that by allowing followers to ask questions, and then answer these questions in the video. An important thing to note about TikTok is that it is not a 100% effort app, as in, it should not take long to record and edit a video for TikTok. It should only take around fifteen minutes to set up and record the video, and then another fifteen minutes to edit it, all on a smartphone. TikTok should also be used as a funnel to lead viewers to other platforms. This includes leading people to other social media pages like Facebook and Instagram or to a video library on YouTube or the CRM website. Using TikTok this way allows CRM to reach more followers and maintain a platform that is highly interactive with an audience, while requiring very little effort to produce content for.

Update Crocodile River Music website

Even though we are aware the CRM website is in progress of being updated, we have a few recommendations to help with this process. Since advertisements lead customers to the website, it is important that the website be up to date prior to distributing advertisements on social media platforms.

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To start, some of the information on the site appears to be outdated. The most recent post for the News page was posted on December 8, 2020, seen in Figure 38.
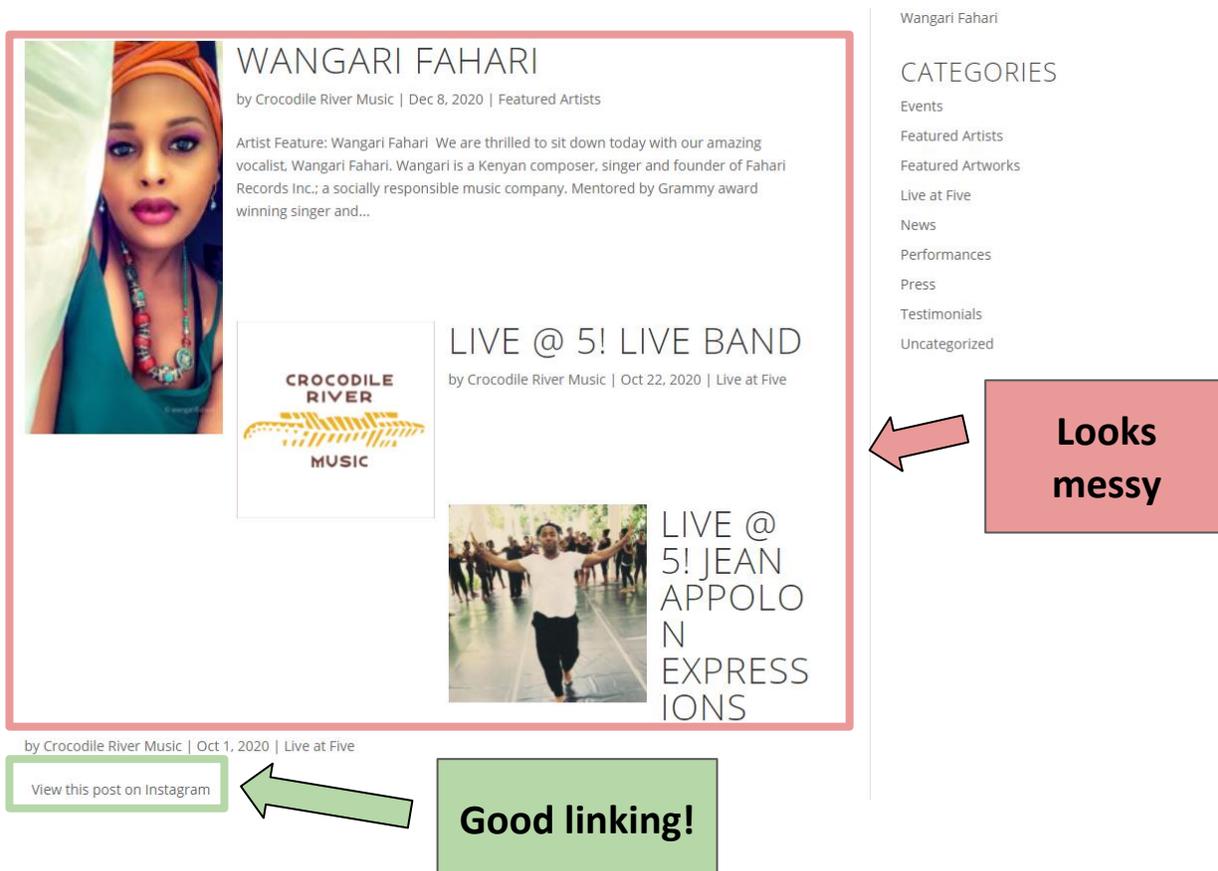
Figure 38: Suggestions for News page on Crocodile River Music website (Crocodile River Music, 2021i)

There is also reference to an event, without a date tied to it, or even location or event website linked, as seen below in Figure 39.

Figure 39: Suggestions for page from Crocodile River Music website (Crocodile River Music, 2021g)

This makes the website feel inactive, so we recommend CRM post something on their website at least once a month, whether that be an upcoming event or simply featuring an artist at CRM. On this webpage, there is also a reference to one of CRM's social media pages. This should be expanded to include every social media platform CRM wishes to promote.

Some finer details that would also help the website look more professional include increasing some font sizes and improving the clarity. Some fonts are simply too small to be easily readable. Also, be clear with what each link is trying to accomplish. It is sometimes confusing, and hard to follow. Details on improvements can be observed in Figures 38 to 40.

Lastly, it would be much more user friendly for the digital residency program if people could pay for the videos directly on the site, rather than having to contact CRM for them (Figure 40).
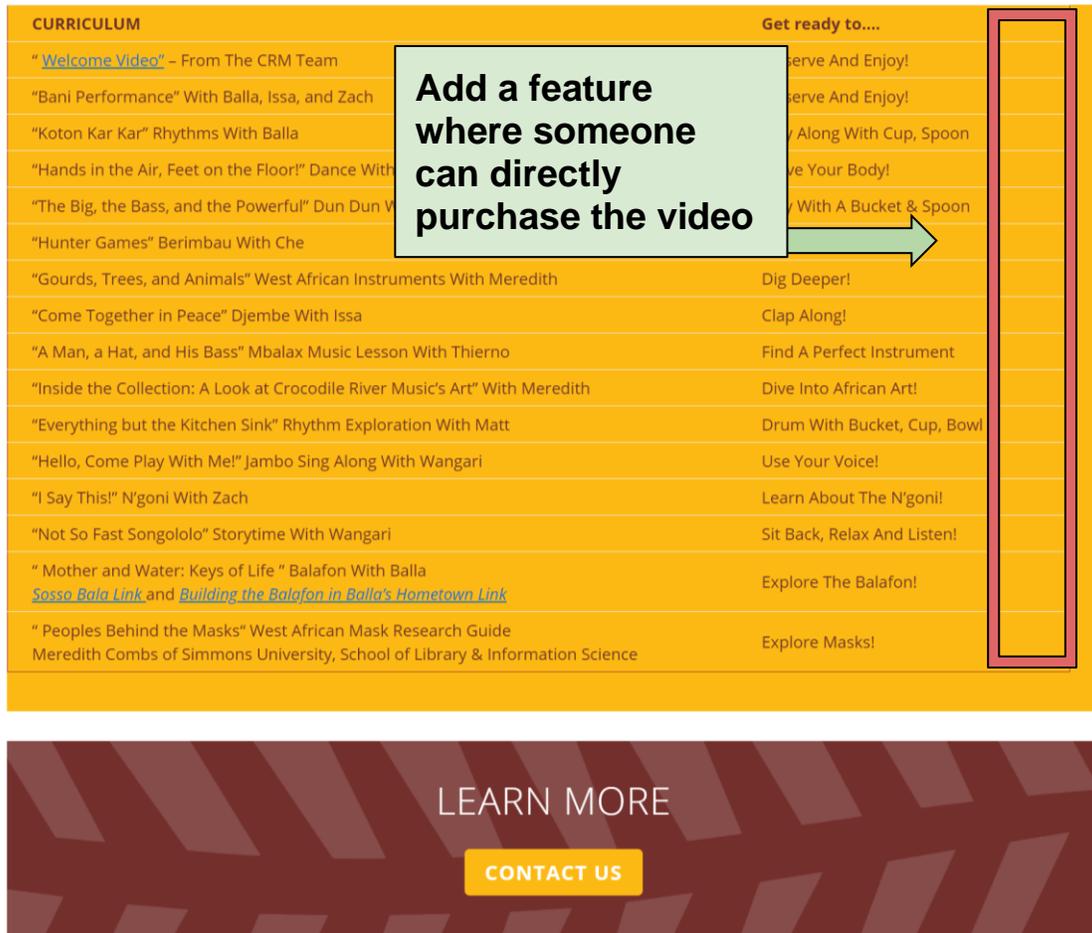
Figure 40: Suggestions for Digital Residencies page on CRM website (Crocodile River Music, 2021b)

An excellent example of this can be seen from Angela Fehr's watercolor course site, below in Figure 41. By allowing people to pay directly off the site, is not just saving CRM time, but also the customer's time. It would be ideal if there was the option to pay for each video individually but then also have an option to pay for all of them at once as well, with a discount. This allows customers to select and choose which ones they would like, but to also give the option to buy them all.

Figure 41: Angela Fehr's course curriculum site (Fehr, 2021)

In conclusion, promotion is not only for people outside the current audience to discover CRM, but to also lead them to a more stable platform, which in this case, should be the website. By applying these recommendations to the website, it will appear more professional and be more efficient, much easier for potential customers to navigate.

Outcomes

With these recommendations, Crocodile River Music will be well equipped for an effective and targeted online presence and can carry onward as in-person events begin again. Additional equipment and the 80/20 rule will make the recording process faster and efficient. A robust library of content will supplement in-person offerings, creating opportunities for viewers across the world to explore CRM without attending in-person events. Active social media accounts will lead more viewers to CRM's website and YouTube page, through engaging photos on Instagram, or educational teaser videos on TikTok. With the advertisements on social media platforms, more viewers will see their posts and have potential to become future customers. Following these recommendations will assist Crocodile River in adapting to a virtual content space and provide robust outreach methods for connecting with viewers.

Conclusion

Broadening the cultural experience and exposure is an extremely important part of educating students about their communities, and Crocodile River Music is in a unique position to offer their art and culture to Worcester and beyond. Even during situations when it is difficult to hold in-person events, such as the COVID-19 pandemic, CRM can absolutely still find opportunities to reach their various audiences virtually. By providing a robust content library and expanding their audience, they are situated to positively impact the lives of countless students and music enjoyers. The recommendations we have made provide a framework for success, which will give direction and insight to be adequately prepared for difficult challenges in the future. As the pandemic restrictions are lifted, CRM should be able to return to in-person events, but digital content can still be extremely valuable, supplementing in-person content. Virtual offerings are not meant to replace in-person content, but to be a valuable tool in introducing viewers to the CRM content library. The sale of virtual content can provide a steady income for the musicians of CRM, which has the potential to increase their opportunities beyond grants and fundraising. In addition, CRM can use their online library and other offerings to reach many more students than they already do, spreading their message and fulfilling their mission not only in New England, but around the world.

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Appendix A

Consent Forms

Consent form for Conducting and Recording Virtual Interviews

We are a group of students from Worcester Polytechnic Institute (WPI) in the United States. We are conducting interviews to learn more about strategies for producing and sharing music in a virtual space. Your participation is voluntary.

Do we have your permission to record this interview?

Yes ☐ | No ☐

Do we have your permission to include your photo?

Yes ☐ | No ☐

Will you allow us to include your name and other identifying information?

Yes ☐ | No ☐

By signing below, I understand that information from this interview will be published at WPI for educational purposes and be made available to the general public.

Sign: Print: Date:

APPENDIX A

Consent form for Conducting Online Survey

Informed Consent Agreement for Participation in a Research Study "Investigation of Audience preferences for virtual media consumption"

Investigators and contact information:
- Professor Shockey (ishockey@wpi.edu)
Crocodile River Music IQP Team (gr-crocodilerivermusic@wpi.edu)
Purpose: The purpose of this study is to understand the preferences of virtual audiences when viewing recorded or live media at home.
Procedures to be followed: This survey will ask you to reflect on your personal preferences for interacting with artists and your favored media platforms.
Record keeping and confidentiality: By clicking "next", you are consenting to helping us learn about audience preferences for use in benefitting an educational organization .
You should feel free to answer to any level to which you wish to disclose. Your responses will come to us as anonymous entries. We may have a sense about who completed it, but cannot tie the data back to particular participants. We will also be sharing this information with our advisors for evaluation purposes anonymously. This survey is not mandatory and your consent is given freely of your own choice.
Any publication or presentation of the data will not identify you, unless you agree to be identified.
For more information about this research, contact the investigators (email addresses are at the top of this document. You can see the final project by emailing a request to our contact information or by using keywords in the search at https://digitalcommons.wpi.edu/iqp/
Your participation in this research is voluntary. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.
By clicking "next" below, you acknowledge that you have been informed about the study and wish to consent to participate. You will be asked again after completing the survey for your consent as a matter of respect for your right to change your mind.

Appendix B

Interview Guide for Platform and Equipment Comparisons

Were you able to perform during the pandemic?

If so, how were you successful in sharing music during the pandemic?

What platforms were the most successful?

What were the best ways to grow your audience?

What are some problems with the platform you're using? What do you wish it had that it doesn't?

What are some challenges you've had to overcome while producing content virtually? How did you overcome them?

Can you recommend any equipment that can be set up for 1 person with a smartphone to record and release music?

What methods have you employed for teaching music during the pandemic? Has it been successful

What is the process you use for recording your performances?

What did you try that you're going to continue with post pandemic?

Interview Guide for Assessment of Musicians' Preferences

What has been your favorite way to share music online (pre vs. post pandemic)?

What platforms did you try and which were the best?

What are some problems with the platform and equipment you're using? What do you wish you had that you don't?

What are some challenges you've had to overcome while producing content virtually? How did you overcome them?

How do you record your performances?

What do you miss most about performing live?

What aspects of your knowledge and skills are most important to you to share?

What equipment do you wish you could try? What equipment would you avoid?

What would be the most amount of money to spend to get optimal equipment?

Who was a good role model to you as you've been sharing your music?

What types of work do you do (education vs. performance, etc.)?

What is the ideal way for you to spend your time (related to last question)

Appendix C

Formal Survey for Educators

Crocodile River Music Audience Preferences

We are a group of students from Worcester Polytechnic Institute working on a research project to help Crocodile River Music reach their audience through virtual and other sustainable modes of programming

As a part of our research, we have designed this survey to assess the preferences of audiences and collaborators on the different ways that CRM can contribute to education.

Investigators and contact information:
Professor Ingrid Shockey (ishockey@wpi.edu)
Crocodile River Music IQP Team (gr-crocodilerivermusic@wpi.edu)

Purpose: The purpose of this study is to understand the preferences of virtual audiences when viewing recorded or live media at home.

Procedures to be followed: This survey will ask you to reflect on your personal preferences for interacting with artists and your favored media platforms.

Record keeping and confidentiality: By clicking "next", you are consenting to helping us learn about audience preferences for use in benefitting an educational organization .
You should feel free to answer to any level to which you wish to disclose. Your responses will come to us as anonymous entries. We may have a sense about who completed it, but cannot tie the data back to particular participants. We will also be sharing this information with our advisors for evaluation purposes anonymously. This survey is not mandatory and your consent is given freely of your own choice.

Any publication or presentation of the data will not identify you, unless you agree to be identified.

For more information about this research, contact the investigators (email addresses are at the top of this document. You can see the final project by emailing a request to our contact information or by using keywords in the search at https://digitalcommons.wpi.edu/iqp/

Your participation in this research is voluntary. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.
By clicking "next" below, you acknowledge that you have been informed about the study and wish to consent to participate. You will be asked again after completing the survey for your consent as a matter of respect for your right to change your mind.

⬤ Next

→

WPI

How would you describe your occupation?

- ○ Educator
- ○ School Administrator
- ○ Other [   ]

What school level(s) are the students you typically work with?

- ☐ K-6 (Elementary)
- ☐ 7-8 (Middle)
- ☐ 9-12 (High School)
- ☐ College

→

WPI

Crocodile River Music

How did you learn about Crocodile River Music?

[   ]

Do you follow any of CRM's social media?

- ☐ YouTube Channel
- ☐ Instagram Account
- ☐ Facebook Page

→

WPI

Educational Programs

Has your school brought in any outside education program during the COVID-19 pandemic (examples: music education, guest speakers, etc.)

- ○ Yes
- ○ No

→

WPI

Please provide a brief description of the program(s).

What parts of the program did students respond to?

What features do you look for in recorded/streaming content for your school?

Please rank the ideal length for recorded/streaming content in your classes.

1-2 mins

2-5 mins

5-10 mins

10-20 mins

20-30 mins

30-45 mins

45+ mins

→

WPI

Post COVID-19

When COVID-19 restrictions are lifted, would your school host in-person events?

How do you see virtual concerts playing a role in your programming once COVID-19 restrictions are lifted?

→

Appendix D

Formal Survey for General Public

Crocodile River Music Audience Preferences

We are a group of students from Worcester Polytechnic Institute working on a research project to help Crocodile River Music reach their audience through virtual and other sustainable modes of programming

As a part of our research, we have designed this survey to assess the preferences of audiences and collaborators on the different ways that CRM can contribute to education.

Investigators and contact information:
Professor Ingrid Shockey (ishockey@wpi.edu)
Crocodile River Music IQP Team (gr-crocodilerivermusic@wpi.edu)

Purpose: The purpose of this study is to understand the preferences of virtual audiences when viewing recorded or live media at home.

Procedures to be followed: This survey will ask you to reflect on your personal preferences for interacting with artists and your favored media platforms.

Record keeping and confidentiality: By clicking "next", you are consenting to helping us learn about audience preferences for use in benefitting an educational organization .
You should feel free to answer to any level to which you wish to disclose. Your responses will come to us as anonymous entries. We may have a sense about who completed it, but cannot tie the data back to particular participants. We will also be sharing this information with our advisors for evaluation purposes anonymously. This survey is not mandatory and your consent is given freely of your own choice.

Any publication or presentation of the data will not identify you, unless you agree to be identified.

For more information about this research, contact the investigators (email addresses are at the top of this document. You can see the final project by emailing a request to our contact information or by using keywords in the search at https://digitalcommons.wpi.edu/iqp/

Your participation in this research is voluntary. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.
By clicking "next" below, you acknowledge that you have been informed about the study and wish to consent to participate. You will be asked again after completing the survey for your consent as a matter of respect for your right to change your mind.

⬤ Next

→

How old are you?
- ○ Under 18
- ○ 18 - 24
- ○ 25 - 34
- ○ 35 - 44
- ○ 45 - 54
- ○ 55 - 64
- ○ 65 - 74
- ○ 75 - 84
- ○ 85 or older

→

WPI

Demographics

Do you live in or near Worcester, MA?

○ Yes
● No

Do you live in New England?

○ Yes
○ No

How would you describe your occupation?

○ Educator
○ School Administrator
○ Musican
○ Student
○ Other [ ]

Have you ever listened to West African music? (West African music is defined as music produced by musicians and artists from countries such as Mali and Ghana)

○ Yes
○ No, but I would consider it
○ No, and I wouldn't consider it

→

WPI

Educational Programs

Has your school brought in any outside education program during the COVID-19 pandemic (examples: music education, guest speakers, etc.)

- ● Yes
- ○ Maybe
- ○ No

Please provide a brief description of the program(s).

What was the student response to the program(s)?

→

WPI

Social Media Habits

What media platform do you spend the most amount of time on?

- ○ Facebook
- ○ Instagram
- ○ Tiktok
- ○ YouTube
- ○ Vimeo

About how much time do spend on this platform per day?

- ○ a few minutes
- ○ less than an hour
- ○ 1-2 hours
- ○ 2-4 hours
- ○ 4+ hours

About how often do you watch videos from Instagram/Facebook/TikTok in their entirety?

- ○ Always
- ○ Most of the time
- ○ About half the time
- ○ Sometimes
- ○ Never

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About how often do you watch videos from YouTube in their entirety?

○ Always

○ Most of the time

○ About half the time

○ Sometimes

○ Never

What time of day do you use Facebook/Instagram/TikTok the most?

○ Morning (before 12:00 PM)

○ Afternoon (12:00 PM - 4:00 PM)

○ Evening (4:00 PM - 8:00 PM)

○ Night (after 8:00 PM)

○ None of the above

→

WPI

Platform Preferences

What is your preferred method of viewing music videos? (please rank)

YouTube

Tiktok

Instagram

Vimeo

Facebook

Other [   ]

How many livestream concerts have you watched in the last year?

[   ]

What is most important to you when watching virtual concerts? (please rank)

Sound quality

Video quality

Video content

Entertainment value

How much (in USD$) would you comfortably pay for a virtual concert?

Do you watch Instagram, TikTok and/or Facebook live streams?
- ○ Yes
- ○ No

What time of day would you prefer to watch short (30mins or less) live streams?
- ○ Morning (before 12:00 PM)
- ○ Afternoon (12:00 PM - 4:00 PM)
- ○ Evening (4:00 PM - 8:00 PM)
- ○ Night (after 8:00 PM)
- ○ None of the above

What time of day would you prefer to watch live streamed concerts (45 mins or more)?
- ○ Morning (before 12:00 PM)
- ○ Afternoon (12:00 PM - 4:00 PM)
- ○ Evening (4:00 PM - 8:00 PM)
- ○ Night (after 8:00 PM)
- ○ None of the above

→

WPI

Crocodile River Music

Have you heard of Crocodile River Music?

- ● Yes
- ○ No

How did you learn about them?

[   ]

Have they led workshops at your school?

- ○ Yes
- ○ No

Do you follow CRM on Instagram, Twitter or Facebook?

- ○ Yes
- ○ No

Have you subscribed to CRM's youtube channel?

- ○ Yes
- ○ No

Have you watched any of their Live @ 5 performances?

○ Yes

○ No

If yes, how many?

[   ]

→

WPI

Post COVID-19

When COVID restrictions are lifted will you go to live in person concerts?

[   ]

Will you still be interested in virtual concerts post COVID-19? Why or why not?

[   ]

→

Appendix E

Interview Guide for Site Assessment of CRM

Can you describe your role here at Crocodile River Music?

What do you like about being a part of CRM?

What programs are you involved in within the organization and which do you enjoy
working on the most?

- Pre-pandemic how many people participated in these programs?
- Have you attempted to create a virtual equivalent of this program and if so has it been
  successful? How are you measuring success?
- Is this/these program(s) profitable for the organization?

In what areas would you like to see Crocodile River Music grow, for example education or virtual or
live performances?

What areas are doing well that should be expanded on?

What is the status of some current projects?

How have dreams/plans evolved pre and post pandemic? What are some stories about how these
plans have changed?

Has the pandemic brought you new opportunities?

Is there a model of what you're trying to create? Who do you know who's doing this well?

Appendix F

Instagram Survey Poll Guide

Informal Survey

Questions:

        Have you purchased any of the Digital Residencies? Yes/No

        Have you gone to any of the Live @ 5 streams? Yes/No

        How much do you interact on Live @ 5? Slide

        Did you watch any of CRM's mini-workshop videos? Yes/No

        Did you know CRM has a YouTube channel? Yes/No

        How often do you watch the entirety of videos on Instagram? Slide

Appendix G

Pairwise Comparison Chart to Determine Weights for Variables when Comparing Platforms in Pugh Matrix

In order to determine the weighting for the specific characteristics of each platform, we have used a pairwise comparison chart (Table 9), which directly compares each variable being assessed to all others. The comparison chart is a tool to compare each variable to every other, to determine the relative importance of each one. When comparing two properties, the more important property is given a score of 1 and the less important property is given a score of 0. If they are of equal importance, they are each given a score of 0.5. Once all the properties are compared, the total is tallied up into the rightmost column, and those values become the weights for the Pugh matrix. The properties we selected to evaluate platforms were user demographic, user retention, audio quality, video storage, monetization,

Table 9: Pairwise Comparison Chart (1 = more important, .5= of equal importance, 0 = less important)

	User Demographic	User Retention	Audio Quality	Video Storage	Monetization	Popularity	Ease of content creation	Total
User Demographic	x	0	0.5	0	0.5	0	0	1
User Retention	1	x	1	1	1	0.5	0	4.5
Audio Quality	0.5	0	x	0	1	0	1	2.5
Video Storage	1	0	1	x	1	0.5	0	3.5
Monetization	0.5	0	0	0	x	0.5	0	1
Popularity	1	0.5	1	0.5	0.5	x	0.5	4
Ease of content creation	1	1	0	1	1	0.5	x	4.5

Link to editable version