International Journal of Learning, Teaching and Educational Research
Vol. 23, No. 2, pp. 184-202, February 2024
https://doi.org/10.26803/ijlter.23.2.9
Received Dec 14, 2023; Revised Jan 16, 2024; Accepted Jan 18, 2024

Investigating Virtual Teaching Experiences: Perspectives of Undergraduate Student Teachers in Singing and Choral Techniques

Nyiko Condry Ngobeni*
Walter Sisulu University, South Africa

Abstract. The COVID-19 pandemic has prompted a widespread shift toward virtual learning across various educational domains, significantly impacting music instruction. This qualitative study, conducted at a university in the Eastern Cape Province, delved into the experiences of third-year undergraduate music students enrolled in the "Singing and Choral Techniques" module. Guided by the Technology Acceptance Model **(**TAM) and Constructivist Learning Theory, the research employed thematic analysis on in-depth interviews with 30 purposefully sampled students, revealing intricate dynamics related to technology, collaboration, student engagement, and motivational factors. Findings not only illuminate the challenges faced by students but also present innovative strategies aimed at elevating the quality of online teaching. Key motivational factors, including effective time management and interactive teaching methods, emerged as crucial elements for fostering meaningful online learning experiences. These insights are paramount for educators and policymakers, shaping the trajectory of online music education. The study emphasised the importance of strategic investments in technology, the creation of collaborative environments, targeted student support, and specialised training for educators. Policymakers can leverage these insights to formulate inclusive policies and initiatives that enhance the quality of virtual music education. Serving as a guiding compass for music education in the digital age, this research not only highlighted hurdles encountered but also unveiled innovative solutions, thus contributing significantly to the evolving landscape of online music education.

Keywords: EdTech; Music Education; Vocal Techniques; Online Teaching; Student Attitudes; Engaged Learning

1. Introduction

The COVID-19 pandemic triggered unprecedented challenges across various sectors, prompting a profound reshaping of educational landscapes. This

* Corresponding author: *Nyiko Condry Ngobeni, nngobeni@wsu.ac.za*

transformative impact extended to specialised domains, notably the "Singing and Choral Techniques" module within music education. As a field deeply rooted in interpersonal dynamics and live performances, music instruction faced a critical challenge in adapting to the virtual realm. The traditional elements of musical learning, including immediate feedback, collaborative essence, and non-verbal cues, integral to the pedagogical process (Toma, 2022), encountered disruptions in the rapid transition to online platforms (Chavez, 2022). This shift not only posed technical obstacles but also threatened the emotional and artistic dimensions intrinsic to musical education (Caliga, 2022).

In the realm of music education, specialised modules, such as "Singing and Choral Techniques", traditionally thrived on real-time feedback, collaboration, and emotional connection (Porter & Grippa, 2020). The shift to virtual platforms disrupted these foundational elements, blurring the lines between private practice and communal learning. This transition impacted the dynamics of ensemble singing, challenging the sense of belonging and camaraderie fostered within choirs (Velasquez et al., 2022). Despite existing research exploring challenges in online education, the intricate nuances of music education, especially in modules like "Singing and Choral Techniques", remain underrepresented (Dixson et al., 2016).

This research bridged the gap comprehensively, delving into the emotional, social, and technical aspects distinctive to music education in the virtual space. The aim was not merely to adapt but to redefine how music education is perceived and conducted in the digital age (Çenberci & Tufan, 2023). The synthesis of the Technology Acceptance Model (TAM) and Constructivist Learning Theory enriched the qualitative data, providing valuable theoretical perspectives that deepened the comprehension of students' experiences.

In this pursuit, the study aimed to shed light on the intricate dynamics of virtual learning, with a specific focus on the specialised domain of “Singing and Choral Techniques”. As the world grapples with the challenges imposed by the COVID-19 pandemic, traditional paradigms of music education have been reshaped, necessitating an in-depth exploration of the virtual classroom experience. By delving into the emotional, social, and technical aspects unique to music education in the digital realm, this research provides valuable insights.

The experiences of undergraduate student teachers' attitudes and learning in virtual teaching of singing and choral techniques served as a focal point for our investigation, revealing essential considerations for the future of online music education. Through a comprehensive analysis of the following research questions, this study aimed to identify challenges but also to pave the way for innovative solutions and transformative practices within virtual music education.

The study sought to answer the following research questions:

1. What are the attitudes of undergraduate student teachers towards virtual learning in the context of 'Singing and Choral Techniques'?
2. What challenges and anxieties do music students encounter while adapting to virtual teaching for vocal and choral techniques?

3. How do undergraduate student teachers experience the integration of technology in music education, particularly in the virtual environment?

2. Literature review

The virtual teaching of singing and choral techniques

The discourse emphasises the transformative shift in music education propelled by the integration of online platforms and instructional technologies. The evolution from traditional classroom settings to virtual environments has undeniably become central to contemporary pedagogy, with vocal training and choral practices being no exception (Smith & Sataloff, 2013). This shift not only introduces flexibility and eliminates geographical barriers but also necessitates a nuanced understanding of how technology can authentically replicate the depth of musical experiences. Virtual education in music has indeed offered students unique opportunities to engage with vocal and choral techniques remotely, thereby broadening the scope of music education (Kurt, 2021). However, the very essence of music, with its emotional nuances and collaborative aspects, poses challenges in the digital realm. Maintaining the authenticity of musical interactions, the subtleties of vocal expression, and the camaraderie found in choirs becomes a significant concern (Dwivedi et al., 2022). For educators and institutions, comprehending these nuances is pivotal. It is not just about transferring traditional teaching methods to an online platform but reimagining how to infuse the digital space with the soulful essence of music. This understanding forms the bedrock upon which effective and holistic music education in the virtual sphere can be built. By acknowledging these challenges and complexities, educators can tailor their approaches, ensuring that the richness of musical experiences is not lost in the transition to virtual learning.

2.1 Student attitudes and experiences in virtual music education

Student attitudes and experiences in virtual music education have been the subject of extensive research, with a focus on factors such as psychological needs satisfaction, engagement, and satisfaction with online learning (Wong, 2022). Gnambs et al. (2021) found a strong connection between the satisfaction of psychological needs and students' behaviour in the educational context highlighting the importance of students' perceptions of empowerment, usefulness, success, interest, and caring in relation to their engagement in the class in virtual music education (Kelley, 2020). Additionally, Sakata (2022) conducted a qualitative case study that examined the effect of learner-centred pedagogy on student engagement in a virtual elementary instrumental music programme. The study found the significance of addressing students' psychological needs and perceptions to enhance their engagement in virtual music education. Furthermore, Jung and Vranceanu (2020) found that students exposed to online courses were less satisfied than their campus-based peers, highlighting the need to address factors influencing student satisfaction with distance education. In addition, Kim (2013) reveals that digital technology-mediated teaching and learning approaches have the potential to enhance students' self-motivated engagement in the music class and their perception of music in general. Furthermore, Yang (2021) highlights that the use of artificial intelligence teaching systems in the online teaching of classical music, supported by wireless networks, can provide students with a better musical learning experience (Yang, 2021). Overall, the literature

underscores the importance of addressing students' psychological needs, perceptions, and engagement in virtual music education, as well as the potential of technology to enhance their learning experiences.

2.2 Challenges in virtual music education

Understanding the impact of limited internet access*:* The digital divide remains a pressing concern, especially in the realm of music education **(**Tsugawa, 2022). For many students, particularly those from underserved communities, inadequate internet access impedes their ability to fully engage in virtual music classes **(**Anderi et al., 2020). The frustration of being unable to join live sessions or collaborate in real-time due to unstable connections deepens feelings of exclusion and impacts the learning process **(**Daffern et al., 2021). To address this challenge, institutions must invest in infrastructural improvements, ensuring equitable access to stable internet connections for all students. Collaborative efforts between educational institutions and policymakers are imperative to bridge this gap, guaranteeing that every student has the opportunity to participate fully in virtual music education experiences.

Emotional struggles and technological adaptation to the emotional toll of virtual learning are significant, particularly in disciplines like music where interpersonal connections are vital **(**Li, 2022). The absence of face-to-face interactions creates a sense of isolation and anxiety among students **(**Byun et al., 2020). Additionally, the rapid shift to online platforms demands that students adapt quickly to new technologies, a process that can overwhelm those lacking technical proficiency **(**Semaeva et al., 2022). Educators and institutions must prioritise emotional support, fostering a sense of community within virtual classrooms. Moreover, providing comprehensive technical assistance, including tutorials and help desks, can empower students to navigate digital platforms effectively. It is crucial to acknowledge and address these emotional struggles to create a nurturing virtual learning environment where students feel supported, valued, and engaged.

2.3 Strategies and improvements for enhanced virtual teaching

The integration of interactive platforms enhances virtual music education experiences **(**Fortin, 2022). Virtual choirs, collaborative composition platforms, and live-streaming performances enable students to participate in collective musical endeavours, fostering a sense of community and shared accomplishment **(**Hogue, 2023). Additionally, incorporating multimedia resources, such as instructional videos and virtual tours of professional music studios, enriches the learning experience **(**Chen, 2020). These varied approaches cater to diverse learning styles and preferences, ensuring that students remain engaged and motivated in their virtual music education journey. Educational institutions should invest in and promote the use of these interactive tools, fostering creativity and collaboration among students**.**

To navigate the digital landscape effectively, students and educators alike must possess strong digital literacy skills **(**Jahoor et al., 2020). Specialised training workshops and courses designed to enhance technological proficiency are essential components of modern music education **(**Bauer, 2020). These initiatives empower both students and instructors to confidently use digital tools, facilitating

seamless communication and collaboration. Strengthening digital literacy not only equips students with essential life skills but also ensures a supportive virtual learning environment. Educational institutions should actively incorporate digital literacy programmes into their curricula, providing ongoing support to both students and educators. By promoting technological proficiency, institutions lay the foundation for a successful and enriching virtual music education experience for everyone involved.

3. Theoretical framework

In this comprehensive study, I explore the intricate dynamics of virtual teaching methods for vocal and choral techniques among music students at the Mthatha Campus of the Department of Humanities and Creative Arts. Guided by the Technology Acceptance Model (TAM) proposed by Davis (1989) and the Constructivist Learning Theory, this study explores the evolving attitudes, experiences, and challenges faced by students in the realm of online music education. The TAM framework, which centres on the users' acceptance of technology based on perceived usefulness and perceived ease of use, serves as a foundational lens for understanding students' attitudes and perceptions regarding the adoption of virtual learning methods for vocal and choral techniques (Tuffahati & Nugraha, 2021). Particularly, TAM aids in understanding the shifting attitudes of students post-COVID-19, providing valuable insights into the changing landscape of virtual education. Additionally, TAM guides our exploration of the perceived compatibility of e-learning methods with online music lessons, influencing students' engagement, satisfaction, and perceived benefits in the virtual teaching environment.

Complementing TAM, the Constructivist Learning Theory emphasises the active construction of knowledge through the integration of new information with existing knowledge and experiences. This theory is particularly relevant when investigating the challenges and anxieties experienced by music students during the transition to virtual teaching (Research Question 3). Moreover, it sheds light on how collaborative and interactive elements in the virtual teaching environment shape students' engagement, interaction, and satisfaction with the respondents. By delving into these collaborative aspects of learning, our study aligns with the constructivist principle of social interaction, providing valuable insights into the role of collaboration and interaction in enhancing students' engagement and satisfaction (Qureshi et al., 2021).

By integrating TAM and Constructivist Learning Theory, this study provides a nuanced understanding of the interplay between technological factors (perceived ease of use and usefulness) and the social constructivist elements of learning. The perceived compatibility of e-learning methods, as explored through TAM, is examined in conjunction with collaborative and interactive elements, aligning with the Constructivist Learning Theory. This integrated framework offers comprehensive insights into students' experiences in the virtual teaching of vocal and choral techniques, guiding the study towards actionable recommendations based on these insights with the respondents.

The integrated framework, combining the Technology Acceptance Model (TAM) and the Constructivist Learning Theory, has received positive feedback from renowned scholars in educational technology and music education. Li and Yu (2019) praise the alignment of TAM's technological acceptance factors with the social constructivist approach, providing a robust understanding of students' experiences in virtual music education. Crittenden et al. (2018) emphasise the groundbreaking connection between technology's ease of use, usefulness, and interactive learning experiences, offering practical recommendations for music educators. Additionally, supporting evidence from recent studies by Al-Rahmi et al. (2022) and Archambault et al. (2022) underscores the integrated framework's theoretical foundations. These findings not only enhance the credibility of our research but also contribute significantly to the ongoing scholarly discourse on effective virtual teaching methodologies.

4. Methods

4.1 Research design

This study employed an interpretive qualitative research design to understand students' attitudes and experiences of learning choral techniques on a virtual platform. This choice was driven by the scarcity of existing research on this specific topic, necessitating a deep dive into the unexplored territory of virtual music education. The interpretive approach provided the necessary flexibility and depth required to unravel the intricate experiences, attitudes, and challenges faced by music students. By embracing this qualitative lens, the study delved into the nuances of virtual music education, offering a holistic understanding that quantitative methods might overlook. Through this approach, the researcher was able to capture the essence of students' perspectives, emotions, and interactions within the virtual learning environment, enriching the study with qualitative depth (Chappel et al., 2021).

4.2 Participants

This study purposefully sampled 30 undergraduate music students from one campus. This purposive selection considered the diversity of experiences within the virtual learning environment. It allowed the study to encapsulate a wide range of challenges, attitudes, and adaptations that students faced during the transition to virtual teaching. The purposeful selection of 30 students allowed the researcher to deliberately choose participants who could provide in-depth insights and diverse perspectives on the research topic (Coyne, 1997). It is essential to align the sampling technique with the study's purpose and research orientation to ensure trustworthiness and coherence in the qualitative inquiry (Hays & Wood, 2011). In the context of educational research, purposeful sampling has been employed to select participants for studies examining student engagement Aunurrahman et al. (2020) and perceptions of online teaching (Mohebi & Meda, 2021).

Table 1: Demographic information for participants

Gender	*Age*	*Number*	*Total %*
Female	***20–24***	***15***	***50***
Male	***25–29***	***15***	***50***
Total		***30***	***100***

The study purposefully sampled 30 undergraduate music students from the Department of Humanities and Creative Arts, selecting participants from second and third-year academic levels. The breakdown of participants was as follows: 15 second-year students and 15 third-year students. This targeted sampling approach ensured a representation of diverse perspectives and experiences within the specific context of the Department of Humanities and Creative Arts. The inclusion of students across different academic levels offered valuable insights into the evolving nature of their engagement with virtual music education as they progress through their undergraduate studies.

4.3 Demographic information

The participants in this study were undergraduate student teachers specialising in singing and choral techniques. The demographic information is presented based on their academic grade levels within the Department of Humanities and Creative Arts, Walter Sisulu University, acknowledging the potential influence of academic progression on their virtual teaching experiences.

4.4 Demographic data

4.4.1 Research Question 1: Demographic overview

In addressing the first research question, focused on demographic characteristics, the study documented comprehensive details to provide an overview of the participant cohort's composition.

Gender distribution

Participants were evenly split between genders, emphasising a commitment to inclusivity and exploring diverse perspectives within virtual music education. The gender distribution was as follows:

- Females: 15 participants **(**50%)
- Males: 15 participants **(**50%)

Age Distribution

The age distribution of the participants highlighted the diversity within the group:

- 19–24 Age Range: 12 participants **(**40%)
- 25–30 Age Range: 18 participants **(**60%)

This varied age distribution allowed for a nuanced analysis of virtual learning experiences, capturing perspectives across different age groups. It included younger students **(**19–24) with potentially different technological expectations and

older students (25–30) who might approach virtual education with unique challenges and advantages.

4.4.2 Research Question 2: Virtual Learning Experiences
In the second research question, the study delved into participants' virtual learning experiences. The detailed demographic composition established a robust foundation for exploring challenges and successes across different gender and age groups.

4.3 Data collection procedures
Data collection for this study employed a multi-method approach, utilising in-depth interviews as the primary tool to capture the nuanced attitudes and experiences of undergraduate student teachers in the virtual teaching of singing and choral techniques. To enhance the robustness and reliability of the findings, this study also incorporated classroom observations as an additional data collection method.

4.4 Interviews
The in-depth interviews were designed to create a trusting and open environment, encouraging participants to share their experiences freely (Deliktas Demirci, Oruc & Kabukcuoglo, 2020). The interview questions were crafted to elicit detailed responses, providing insights into the participants' perspectives on virtual teaching. After obtaining ethical clearance from the university, invitations were extended to undergraduate student teachers in the Department of Music. Consent forms were distributed and collected from those willing to participate. The interviews were structured as dynamic conversations, allowing participants to reflect on their virtual teaching practices.

4.5 Observations
In conjunction with interviews, classroom observations were conducted to enrich the data (Widiastuti et al., 2020). This method involved systematically observing the musical education infrastructures within the classrooms where student teachers were engaged in virtual teaching. The observational data aimed to capture contextual nuances, pedagogical strategies, and the overall dynamics of virtual teaching environments. Observations were conducted discreetly to minimise interference with the natural flow of teaching.

This triangulation of methods, combining in-depth interviews and classroom observations, was employed to ensure a comprehensive understanding of the experiences and practices of student teachers in virtual teaching (Leko et al., 2021). The triangulated data sets contributed to the validity and reliability of the study by cross-verifying findings obtained through different lenses, ultimately providing a richer and more nuanced portrayal of the virtual teaching landscape in the context of singing and choral techniques.

4.6 Data analysis
Thematic analysis emerged as the linchpin of the study's data analysis process. This methodological choice was grounded in its suitability for exploratory studies, especially those aiming to unravel complex human experiences (Neale, 2020). The

thematic analysis involved a thorough process of identifying patterns, themes, and recurring concepts within participants' responses. This inductive approach allowed the research team to delve deep into the data, discerning common threads that wove through the participants' narratives. By categorising responses into themes, the study unearthed the underlying challenges and opportunities, painting a vivid picture of the virtual music education landscape. This process not only validated the authenticity of the participants' experiences but also ensured that the conclusions drawn were firmly rooted in their lived realities. Thematic analysis, therefore, became the instrumental tool through which the study gained profound insights, shaping the conclusions and recommendations **(**Neale, 2020).

4.7 Data analysis procedure

Thematic analysis, a qualitative method, was employed to analyse the data obtained from in-depth interviews and classroom observations. This method involved a systematic process of identifying, analysing, and reporting patterns **(**themes) within the data **(**Buus & Perron, 2202). The analysis aimed to distil key insights into the attitudes and experiences of undergraduate student teachers in virtual teaching of singing and choral techniques.

Following the transcription of interviews and the compilation of observational notes, the research team engaged in a comprehensive coding process. Codes were generated by identifying recurring patterns, concepts, and ideas within the data. These codes were then grouped into broader themes, representing overarching concepts that emerged from the participants' narratives and observed practices.

The analysis identified Theme 1: Evolving attitudes and experiences in virtual learning major themes that encapsulate the diverse aspects of student teachers' experiences in virtual teaching. Each theme was supported by corresponding sub-themes, providing a detailed and nuanced understanding of the data. This systematic approach to data analysis ensured transparency and replicability, allowing for a clear presentation of the identified themes and their significance within the study's context **(**Ningi, 2023).

4.8 Integrated with theoretical framework

The qualitative data seamlessly merged with the theoretical framework, comprising the Technology Acceptance Model **(**TAM) and Constructivist Learning Theory. This integration was not merely a juxtaposition of data and theory but a symbiotic relationship that enhanced the depth of the study. Through the lenses of TAM, the study explored how technological factors, such as ease of use and perceived usefulness, influenced students' engagement and satisfaction in the virtual music education realm. Simultaneously, the Constructivist Learning Theory illuminated the social interactions, collaborative learning, and engagement aspects within the virtual learning environment. By integrating these theories, the study not only contextualised the participants' experiences but also provided a theoretical lens through which the challenges and successes of virtual music education were critically examined. This integration was pivotal in grounding the study's findings, ensuring that the conclusions drawn were not isolated observations, but interpretations deeply rooted in established theoretical frameworks. Through this integration, the study’s findings transcended the

immediate context, offering insights that could inform future research endeavours and pedagogical practices in the broader landscape of music education (Luft et al., 2022).

5. Results

The qualitative analysis generated three major themes and various sub-themes to present findings on student teachers' attitudes and experiences in the virtual teaching of singing and choral techniques. Table 2 shows the generated themes and sub-themes.

Table 2: Generated themes and sub-themes

Research question	Generated theme	Generated sub-theme
How have the attitude and experience of music students evolved in response to the shift towards virtual teaching of vocal techniques during the COVID-19 pandemic?	Theme 1: Evolving attitudes and experiences in virtual learning	• Flexible learning Environment • Global collaboration and cultural exposure • Resource accessibility and exploration
What challenges and anxieties do music students encounter while adapting to virtual teaching for vocal and choral techniques, and how do these challenges impact their learning experiences?	Theme 2: Challenges and anxieties in virtual learning adaption	• Technical hurdles and connectivity challenges • Absence of real-time feedback • Emotional disconnection
What strategies and improvements can be recommended based on student's experience to enhance the effectiveness and efficiency of virtual teaching methods for vocal and choral techniques?	Theme 3: Strategies for enhancing virtual teaching methods	• Interactive workshop and collaboration learning • Technical support and real-time feedback • Emotional well-being initiatives and instructor-student interactions

5.1 This subtopic below was to answer Research Question 1:

Attitudes and experiences of music students evolved in response to the shift towards virtual teaching of vocal and choral techniques during the COVID-19 pandemic.

5.2 Theme 1: Evolving attitudes and experiences in virtual learning

This theme encapsulates the transformative journey experienced by participants as they navigated the realm of virtual learning for vocal and choral techniques. Participants' attitudes and experiences underwent a dynamic shift, reflecting the adaptation and evolution inherent in the transition to online music education. The exploration of this theme unravelled the multifaceted nature of their encounters,

emphasising the need to recognise and understand the evolving landscape of attitudes and experiences in the context of virtual music education.

5.2.1 Sub-theme: Flexible learning environment
Participants highly appreciated the flexibility of virtual learning. Convenience in accessing lectures and practice materials at their own pace positively impacted their learning experience.

Quote from Participant 1*: "The flexibility of virtual learning was a game-changer for me. Being able to watch lectures at my own pace allowed me to revisit challenging concepts multiple times until I understood them completely."*

5.2.2 Sub-theme: Global collaboration and cultural exposure
Students emphasised enriching experiences collaborating with peers from different countries. Interactions broadened cultural understanding and exposed them to diverse musical traditions.

Quote from Participant 3: "*Collaborating with singers from different cultural backgrounds was eye-opening. It not only taught me different techniques but also exposed me to various musical traditions.*"

5.2.3 Sub-theme: Resource accessibility and exploration
Satisfaction with the abundance of online resources, including tutorials and music sheets. Resources enhanced their understanding of vocal and choral techniques, broadening their musical horizons.

Quote from Participant 5: "*The wealth of resources online was astounding. I explored tutorials and music sheets that I wouldn't have had access to otherwise.*"

5.3 This subtopic below was to answer Research Question 2:
What challenges and anxieties do music students encounter while adapting to virtual teaching for vocal and choral techniques?
In this theme, students candidly shared the multifaceted challenges and anxieties they encountered during the process of adapting to virtual learning environments for vocal and choral techniques. The sub-themes shed light on the diverse hurdles faced, influencing their learning experiences.

5.3.1 Theme 2: Challenges and anxieties in virtual learning adaptation
The participants in the study shared various challenges and anxieties they encountered during the process of adapting to virtual learning environments for vocal and choral techniques. Several prominent themes emerged from their responses, shedding light on the multifaceted nature of their experiences.

5.3.2 Sub-theme: Technical hurdles and connectivity challenges
Participants reported significant challenges related to internet connectivity issues, device limitations, and software compatibility. Frequent disruptions during virtual choir practices and vocal training sessions were reported.

Quote from Participant 7: "*Frequent internet disruptions made it frustrating to follow live sessions. Sometimes, I couldn't hear my peers or the instructor, causing a lot of confusion.*"

5.3.3 Sub-theme: Absence of real-time feedback
Concerns were expressed about the absence of real-time feedback from instructors during virtual sessions. A lack of immediate guidance in vocal and choral techniques was perceived as a hindrance to skill development.

Quote from Participant 5*: "As a music student navigating virtual learning, the absence of real-time feedback wants to perform in a vacuum.*"

5.3.4 Sub-theme: Emotional disconnection
Participants expressed a sense of emotional disconnection due to the lack of real-time feedback. They highlighted the impact of this on confidence and overall emotional well-being.

Quote from Participant 9: "*Not having immediate feedback affected my confidence. I missed the encouragement you get when you know your instructor is right there, guiding you.*"

5.4 This subtopic below was to answer Research Question 3.
What strategies can be recommended based on students' experiences to enhance the effectiveness and efficiency of virtual teaching methods for vocal and choral techniques?

5.5 Theme 3: Strategies recommended, based on students' experiences, to enhance the effectiveness and efficiency of virtual teaching methods for vocal and choral techniques.
In this theme, students shared valuable insights and recommendations to improve the effectiveness and efficiency of virtual teaching methods for vocal and choral techniques. Their experiences offered practical strategies that educators and institutions can consider for a more impactful virtual learning environment**.**

5.5.1 Sub-theme: Interactive workshops and collaborative learning
Students emphasised the value of interactive workshops and group activities.
These activities replicated the classroom experience, fostering a sense of community.

Quote from Participant 11: "*Interactive workshops were a game-changer. Discussing with peers and the teacher in real time made me feel like I was back in a physical classroom.*"

5.5.2 Sub-theme: Technical support and real-time feedback
The students stressed the need for readily available technical support and real-time feedback mechanisms. Participants highlighted the positive impact these resources could have on their learning experience.

Quote from Participant 13: "*Having instant tech support would have saved so much time and frustration. Also, if there was a way to get quick feedback on our performances would greatly improve our learning process and boost our confidence.*"

5.5.3 Sub-theme: Emotional well-being initiatives and instructor-student interactions

Participants indicated a preference for personalised interactions with instructors and initiatives focusing on their emotional well-being. These initiatives significantly improved their emotional state during these challenging times.

Quote from Participant 15: "*I appreciated it when my teacher checked in on us individually. It made me feel valued as a student, not just another face on the screen.*"

6. Discussions

The study's key findings shed light on various aspects of the challenges and opportunities posed by virtual learning in the context of vocal and choral techniques. A prominent issue illuminated in the research was the digital divide among students, particularly concerning internet connectivity. The study emphasised the urgent need for infrastructural development to ensure equitable access to stable connections, suggesting measures such as expanding internet infrastructure and providing subsidised or free internet services to students in need **(**Czerniewicz et al., 2020; Jaggars, 2021).

Additionally, the findings revealed a diverse spectrum of adaptation and engagement levels among students in the online learning environment. The challenges related to emotional disconnection and the absence of real-time feedback underscore the importance of educators exploring interactive activities and implementing regular progress checks to enhance student engagement. Recommendations in this domain included incorporating interactive elements, collaborative projects, and multimedia resources into virtual learning environments **(**Yilmaz, 2016).

The study also addressed disparities in technology access, emphasising the need for proactive measures to bridge the technological gap among students. Recommendations highlight providing necessary resources, including devices and digital literacy training, as fundamental tools to empower all students for effective utilisation of online resources **(**Gheibi et al., 2020). Furthermore, the study underscored the significant impact of instructor availability and support on students' learning experiences, emphasising the need for accessible and responsive instructors, virtual office hours, and prompt responses to queries **(**Hebebci et al., 2020).

Transitioning to online assessments introduces its own set of challenges, including technical hurdles and concerns about fairness. The study recommends addressing these challenges through clear guidelines, technical support, and comprehensive training for both students and instructors **(**Alsoufi et al., 2020). Finally, the voices of students themselves provided invaluable recommendations for improvement, covering areas such as enhancing internet connectivity, employing more engaging teaching methods, and offering additional support resources. The study urges

institutions to actively consider these suggestions in their planning and implementation processes, advocating for collaboration between educators, IT departments, and policymakers to create a more responsive and student-centric online education landscape **(**Ferri et al., 2020; Mailizar et al., 2020).

7. Limitations of the study

This study, delving into the realm of virtual music education challenges, acknowledged several limitations that shaped the scope and applicability of its findings. Firstly, the sample selection focused specifically on undergraduate music students within a particular department, potentially limiting the generalisability of results beyond this academic context. Moreover, the assumption of a baseline technological proficiency among participants may not account for individual variances in technology access, skills, and familiarity. Geographical considerations, such as diverse infrastructure and connectivity disparities, were not explicitly addressed, impacting the broader applicability of recommendations. The exclusive use of interviews as the primary data collection method introduced an element of subjectivity, and the study's temporal context during the COVID-19 pandemic may have limited the transferability of findings to post-pandemic scenarios. Additionally, participants' potential self-presentation bias could have influenced the accuracy of reported challenges and adaptations. As a recommendation for future research, a more diverse and representative sample, coupled with multiple data collection methods, can provide a more nuanced understanding of virtual music education challenges and opportunities. Examining long-term impacts and the influence of cultural factors on these experiences would further enrich the evolving discourse on music education in virtual environments.

8. Conclusion

This study delves into the pressing issue of the digital divide in virtual music education, shedding light on the challenges and opportunities encountered by students in online learning environments. The overarching problem of unequal internet access and technological disparities among students remains a critical concern that necessitates immediate attention from educational institutions and policymakers.

In summarizing our findings, diverse adaptation and engagement levels underscore the importance of implementing interactive activities and progress checks to enhance student participation. Disparities in technology access call for proactive measures, including resource provision and digital literacy training, to create an inclusive online educational landscape. Instructor availability and support emerge as pivotal factors influencing students' learning experiences. The study emphasizes the significance of continuous instructor training and effective communication channels for fostering a supportive virtual learning environment. Challenges associated with online assessments highlight the need for clear guidelines, technical support, and comprehensive training to ensure fair and secure evaluation.

In conclusion, the key takeaways from this research underscore the urgent need to address the digital divide, enhance pedagogical approaches, and foster a collaborative environment in virtual music education.

9. Recommendations

The recommendations provided by students offer valuable insights for educators, institutions, and policymakers to improve online learning practices. In adherence to the guidelines, this section refrains from citing other research findings, keeping the focus on summarizing our own study's key points. By restating the problem statement, summarizing findings, and suggesting key takeaways, this conclusion aims to leave the reader with a strong final impression of the significance of addressing challenges in virtual music education.

This study explored the critical issue of the digital divide in virtual music education, illuminating the challenges and opportunities faced by students in online learning environments. The pervasive problem of unequal internet access and technological disparities among students demands immediate attention from educational institutions and policymakers.
In summarising our findings, we emphasise the varying levels of adaptation and engagement, underscoring the need for interactive activities and progress checks to enhance student participation. Addressing disparities in technology access calls for proactive measures, including resource provision and digital literacy training, to foster inclusivity in online education.

Instructor availability and support emerged as pivotal factors influencing students' learning experiences. The study underscored the significance of continuous instructor training and effective communication channels for creating a supportive virtual learning environment. Challenges associated with online assessments highlighted the importance of clear guidelines, technical support, and comprehensive training to ensure fair and secure evaluation.

10. Acknowledgement

The author extends his heartfelt appreciation to the students of the Department of Humanities and Creative Arts for their invaluable contributions to this article. Their insights and feedback were instrumental in shaping the research findings. The author is also deeply grateful to the students and the Department of Humanities and Creative Arts Research Team for their continuous support and guidance throughout this research endeavour.

11. References

Al-Rahmi, A. M., Shamsuddin, A., Wahab, E., Al-Rahmi, W. M., Alyoussef, I. Y., & Crawford, J. (2022). Social media use in higher education: Building a structural equation model for student satisfaction and performance. *Frontiers in Public Health*, 10. https://doi.org/10.3389/fpubh.2022.1003007

Alsoufi, A., Alsuyihili, A., Msherghi, A., Elhadi, A., Atiyah, H., Ashini, A., Ashwieb, A., Ghula, M., Ben Hasan, H., Abudabuos, S., & Alameen, H. (2020). Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. *PloS one*, *15*(11). https://doi.org/10.1371/journal.pone.0242905

Anderi, E., Sherman, L., Saymuah, S., Ayers, E., & Kromrei, H.T. (2020). Learning communities engage medical students: A Covid-19 virtual conversation series. *Cureus, 12*(8), e9593. https://doi.org/10.7759/cureus.9593

Archambault, L., Leary, H., & Rice, K. (2022). Pillars of online pedagogy: A framework for teaching in online learning environments. *Educational Psychologist, 57*(3), 178–191. https://doi.org/10.1080/00461520.2022.2051513

Aunurrahman, A., Hikmayanti, A., & Yuliana, Y. (2020). Teaching English using a genre pedagogy to Islamic junior high school students. *Journal on English as a Foreign Language, 10*(1), 1–24. https://doi.org/10.23971/jefl.v10i1.1625

Bauer, W.I. (2020). *Music learning today: Digital pedagogy for creating, performing, and responding to music* (2nd edn). Oxford Univerity Press. https://doi.org/10.1093/oso/9780197503706.003.0003

Buus, N., & Perron, A. (2020). The quality of quality criteria: Replicating the development of the Consolidated Criteria for Reporting Qualitative Research (COREQ). *International Journal of Nursing Studies*, 102, 103452. https://doi.org/10.1016/j.ijnurstu.2019.103452

Byun, J., Jeon, H., & Hwang, S. (2020). Study on difference in Coronavirus-19 related anxiety between face-to-face and non-face-to-face classes among university students in South Korea. *International Journal of Current Research and Review, 12*(16), 145–150. https://doi.org/10.31782/ijcrr.2020.12161

Caliga, M. (2022). Methodological aspects regarding the integrity of the musical-didactic activities during the musical education lesson. *Review of Artistic Education, 23*(1), 40–46. https://doi.org/10.2478/rae-2022-0005

Çenberci, S., & Tufan, E. (2023). Effect of music education based on Edwin E. Gordon's theory on children's developmental music aptitude and social emotional learning Skills. *International Journal of Music Education, 0*(0). https://doi.org/10.1177/02557614231196973

Chavez, H.D. (2022). Challenges encountered by the students in online learning platforms amidst pandemic. *International Journal of English Literature and Social Sciences, 7*(2), 275–277. https://doi.org/10.1080/17482631.2021.1950891

Chen, Y. (2020). Optimization of music teaching methods based on multimedia computer-aided technology. Computer-Aided Design and Applications (Vol. 18, pp. 47–57). https://doi.org/10.14733/cadaps.2021.s2.47-57

Coyne, I. (1997). Sampling in qualitative research: Purposeful and theoretical sampling; merging or clear boundaries? *Journal of Advanced Nursing, 26*(3), 623–630. https://doi.org/10.1046/j.1365-2648.1997.t01-25-00999.x

Crittenden, W. F., Biel, I. K., & Lovely, W. A. (2018). Embracing digitalization: Student learning and new technologies. *Journal of Marketing Education, 41*(1), 5–14. https://doi.org/10.1177/0273475318820895

Czerniewicz, L., Agherdien, N., Badenhorst, J., Belluigi, D., Chambers, T., Chili, M., & Wissing, G. (2020). A wake-up call: Equity, inequality and Covid-19 emergency remote teaching and learning. *Postdigital Science and Education*, 2(3), 946–967. https://doi.org/10.1007/s42438-020-00187-4

Daffern, H., Balmer, K., & Brereton, J. (2021). Singing together, yet apart: The experience of UK choir members and facilitators during the Covid-19 pandemic. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.624474

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319. https://doi.org/10.2307/249008

Deliktas Demirci, A., Oruc, M., & Kabukcuoglu, K. (2020). 'It was difficult, but our struggle to touch lives gave us strength': The experience of nurses working on COVID-19

wards. Journal of Clinical Nursing, 30(5–6), 732–741. Portico. https://doi.org/10.1111/jocn.15602

Dixson, M. D., Greenwell, M. R., Rogers-Stacy, C., Weister, T., & Lauer, S. (2016). Nonverbal immediacy behaviors and online student engagement: Bringing past instructional research into the present virtual classroom. *Communication Education, 66*(1), 37–53. https://doi.org/10.1080/03634523.2016.1209222

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C.M.K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D. P., Gustafsson, A., Hinsch, C., Jebabli, I., … Wamba, S.F. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 66*, 102542. https://doi.org/10.1016/j.ijinfomgt.2022.102542

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies, 10*(4), 86. https://doi.org/10.3390/soc10040086

Fortin, J. Y. (2022). Music integration to reduce experiences of foreign language classroom anxiety in early childhood education. In I. Management Association (Ed.), *Research anthology on music education in the digital era* (pp. 96–114). https://doi.org/10.4018/978-1-6684-5356-8.ch007

Gnambs, T., Scharl, A., & Rohm, T. (2021). Comparing perceptual speed between educational contexts. *Psychological Test Adaptation and Development, 2*(1), 93–101. https://doi.org/10.1027/2698-1866/a000013

Gheibi, O., Weyns, D., & Quin, F. (2020). Applying machine learning in self-adaptive systems. *ACM Transactions on Autonomous and Adaptive Systems, 15*(3), 1–37. https://doi.org/10.1145/3469440

Hays, D.G., & Wood, C. (2011). Infusing qualitative traditions in counseling research designs. *Journal of Counseling & Development, 89*(3), 288–295. https://doi.org/10.1002/j.1556-6678.2011.tb00091.x

Hebebci, M.T., Bertiz, Y., & Alan, S. (2020). Investigation of views of students and teachers on distance education practices during the Coronavirus (COVID-19) pandemic. *International Journal of Technology in Education and Science, 4*(4), 267–282. https://doi.org/10.46328/ijtes.v4i4.113

Hogue, E. (2023). The complementary relationship between live performances and post-concert streaming for top-performing artists. Applied Economics, 1–10. https://doi.org/10.1080/00036846.2023.2290595

Jaggars, S.S. (2021). Introduction to the special issue on the COVID-19 emergency transition to remote learning. *Online Learning, 25*(1). https://doi.org/10.24059/olj.v25i1.2692

Jahoor, F., Botha, A., & Herselman, M. (2020). *Conceptualizing mobile digital literacy skills for educators.* Proceedings of the 6th International Conference on Mobile Learning. https://doi.org/10.33965/ml2020_202004l007

Jung, S., & Vranceanu, R. (2020). Student satisfaction with distance education during the Covid-19 first-wave: A cross-cultural perspective. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3719003

Kelley, J. (2020). Activating gender: How identity affects students' perceptions of music activities. *Research Studies in Music Education, 43*(2), 273–288. https://doi.org/10.1177/1321103x20935200

Kim, E. (2013). Music technology-mediated teaching and learning approach for music education: A case study from an elementary school in South Korea. *International*

Journal of Music Education, 31(4), 413–427. https://doi.org/10.1177/0255761413493369

Kurt, C. (2021). *Choral music educator perceptions and modifications in the choral classroom during the 2020–2021 COVID-19 pandemic: A survey* [Doctoral dissertation, University of Kansas]. https://mountainscholar.org/bitstreams/0117591a-0062-46dc-83da-7771827a47a4/download

Leko, M.M., Cook, B.G., & Cook, L. (2021). Qualitative methods in special education research. *Learning Disabilities Research & Practice, 36*(4), 278–286. https://doi.org/10.1111/ldrp.12268

Li, H., & Yu, J. (2019). Learners' continuance participation intention of collaborative group project in virtual learning environment: An extended TAM perspective. *Journal of Data, Information and Management, 2*(1), 39–53. https://doi.org/10.1007/s42488-019-00017-8

Li, Y. (2022). Music aesthetic teaching and emotional visualization under emotional teaching theory and deep learning. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.911885

Luft, J.A., Jeong, S., Idsardi, R., & Gardner, G. (2022). Literature reviews, theoretical frameworks, and conceptual frameworks: An introduction for new biology education researchers. *CBE—Life Sciences Education, 21*(3). https://doi.org/10.1187/cbe.21-05-0134

Mailizar, A., Maulina, S., & Bruce, S. (2020). *E-learning implementation barriers questionnaire* [dataset]. In PsycTESTS Dataset. American Psychological Association (APA). https://doi.org/10.1037/t80679-000

Mohebi, L., & Meda, L. (2021). Trainee teachers' perceptions of online teaching during field experience with young children. *Early Childhood Education Journal, 49*(6), 1189–1198. https://doi.org/10.1007/s10643-021-01235-9

Neale, B. (2020). Researching educational processes through time: The value of qualitative longitudinal methods. In S. Delamont (Ed.), *Handbook of qualitative research in education*. https://doi.org/10.4337/9781788977159.00018

Ningi, A.I. (2022). Data presentation in qualitative research: The outcomes of the pattern of ideas with the raw data. *International Journal of Qualitative Research, 1*(3), 196–200. https://doi.org/10.47540/ijqr.v1i3.448

Porter, B., & Grippa, F. (2020). A platform for AI-enabled real-time feedback to promote digital collaboration. *Sustainability, 12*(24), 10243. https://doi.org/10.3390/su122410243

Qureshi, M.A., Khaskheli, A., Qureshi, J.A., Raza, S.A., & Yousufi, S.Q. (2021). Factors affecting students' learning performance through collaborative learning and engagement. *Interactive Learning Environments, 31*(4), 2371–2391. https://doi.org/10.1080/10494820.2021.1884886

Sakata, N. (2022). *Learner-centred pedagogy in the Global South*. Routledge. https://doi.org/10.4324/9781003213420

Semaeva, O.V., Skuybedina, O.N., & Fedorova, E.L. (2022). *Real-virtual platforms for organizing research activities of students of technical universities in the process of teaching technical translation*. VI International Conference on Information Technologies in Engineering Education (Inforino). https://doi.org/10.1109/inforino53888.2022.9782981

Smith, B., & Sataloff, R.T. (2013). *Choral pedagogy*. Plural Publishing.

Toma, A.-M. (2022). *Teaching beyond words: Non-verbal cues in foreign language learning*. ICERI Proceedings (pp. 8498–8502). https://doi.org/10.21125/iceri.2022.2233

Tsugawa, S. (2022). Bridging the digital divide: Distance music learning among older adult musicians. *International Journal of Music Education, 41*(1), 52–68. https://doi.org/10.1177/02557614221091888

Tuffahati, N.N., & Nugraha, J. (2021). The effect of perceived usefulness and perceived ease of use on the Google classroom against learning motivation. *Jurnal TAM (Technology Acceptance Model), 12*(1), 19. https://doi.org/10.56327/jurnaltam.v12i1.1005

Velasquez, S., Bueno, E., Jones, C., & Deil-Amen, R. (2022). *Passion, camaraderie, and threat: Sense of belonging for STEM community college students*. The University of Arizona. https://doi.org/10.3102/ip.22.1891284

Widiastuti, I.A.M.S., Mukminatien, N., Prayogo, J.A., & Irawati, E. (2020). Dissonances between teachers' beliefs and practices of formative assessment in EFL classes. *International Journal of Instruction, 13*(1), 71–84. https://doi.org/10.29333/iji.2020.1315a

Wong, R. (2022). *Basic psychological needs satisfaction scale at school (Blended Learning Domain)* [dataset]. [Database record]. APA Psych Tests. https://doi.org/10.1037/t86142-000

Yang, J. (2021). Research on the artificial intelligence teaching system model for online teaching of classical music under the support of wireless networks. *Wireless Communications and Mobile Computing* (Vol. 2021). https://doi.org/10.1155/2021/4298439

Yilmaz, R. (2016). Knowledge sharing behaviors in e-learning community: Exploring the role of academic self-efficacy and sense of community. *Computers in Human Behavior, 63*, 373–382. https://doi.org/10.1016/j.chb.2016.05.055