



**Digital technologies in Higher Education  
for Chamber Music**

**State of the art  
analysis**





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Project n. 2021-1-IT02-KA220-HED-000027601

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<b>Project Result</b>	PR1: Digital technologies in Higher Education for Chamber Music. State of the art analysis
<b>Leading Organization</b>	Erasmushogeschool Brussel
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<b>Version</b>	2
<b>Use (external / internal)</b>	External
<b>Date</b>	30/09/2024



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## Introduction

The field of higher music education, encompassing conservatories, academies, and universities, has been undergoing significant transformations due to the rise of digital technologies. In recent years, the traditional modes of instruction that once dominated these institutions—face-to-face lessons, in-person rehearsals, and live performances—have been complemented and sometimes supplanted by new approaches to learning. Distance learning, which allows for instruction to occur remotely, and blended learning, which merges online learning with in-person interactions, have emerged as pivotal components of modern teaching practices. This shift towards digital education methods has been influenced by technological advancements, changes in student expectations, and the necessity for flexibility in educational delivery.

A crucial catalyst for the widespread adoption of these methods has been the COVID-19 pandemic, which brought about unprecedented challenges for educational institutions worldwide. For music conservatories, where learning traditionally relies heavily on in-person interactions, ensemble practices, and live feedback, the pandemic posed particular challenges. With lockdowns and restrictions on gatherings, conservatories had to pivot quickly to online formats to ensure the continuity of music education. This sudden shift exposed both the potential and limitations of digital technologies in a field that is inherently interactive and performance-based. Institutions that had previously used online tools in a limited capacity found themselves exploring the full spectrum of digital teaching methods, from video conferencing platforms to sophisticated tools for real-time collaboration.

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The transition to distance and blended learning is characterized by two primary modes of delivery: synchronous and asynchronous methods. **Synchronous learning** involves real-time interaction between instructors and students, closely mirroring traditional classroom settings. It enables immediate feedback and interaction, which are critical in music education, where aspects like technique, intonation, and dynamics are best addressed through live demonstrations and corrections. However, synchronous online learning also presents challenges, such as the need for stable internet connections and managing latency issues, which can disrupt the flow of musical instruction and ensemble practice.

On the other hand, **asynchronous learning** offers a more flexible approach. It allows students to access recorded lectures, tutorials, and instructional materials at their convenience, making it particularly suitable for theoretical subjects like music history, analysis, and even composition. Asynchronous learning has proven beneficial for students who may need to revisit complex material at their own pace or those balancing study with professional engagements. However, it can lack the immediacy and interactive qualities that are vital for mastering performance skills. In response, many conservatories have adopted a **blended learning** model, combining the advantages of both synchronous and asynchronous methods. This approach allows for a more holistic educational experience, where students can benefit from structured, interactive sessions while also taking advantage of self-paced study materials.

Blended learning has also addressed some of the unique challenges posed by the teaching of chamber music and ensemble performance. In traditional settings, chamber music relies on in-person rehearsals, where musicians interact closely, responding to each other's cues and creating a

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unified sound. The shift to blended and online models has required educators to rethink these dynamics. For example, instructors have developed new methods for online rehearsals, where individual parts are practiced remotely and later synchronized using digital tools. Some conservatories have even incorporated advanced platforms like **Networked Music Performance (NMP) systems**, which minimize latency, allowing musicians in different locations to perform together in real time. This has enabled a degree of collaborative music-making that was previously thought impossible in a remote setting.

The adoption of digital technologies in music education has not only transformed teaching practices but has also had a profound impact on students' learning experiences. Digital platforms have made music education more **accessible** to a wider audience, overcoming geographical barriers that once limited opportunities for students in remote or underserved areas. Students who previously had to travel long distances to attend a prestigious conservatory can now participate in masterclasses, workshops, and even degree programs from their home countries. This has particularly benefited students from rural areas or those with financial constraints that make relocation for studies difficult. By reducing these barriers, digital learning has democratized access to high-quality music education, fostering a more inclusive environment.

Moreover, the ability to record and review lessons has introduced a new dimension to music pedagogy. Instructors can provide **video feedback**, allowing students to observe their own progress and self-correct over time. This method is especially useful for refining technical aspects of playing or singing, where subtle adjustments can make a significant difference in performance quality. Additionally, students have access to a broader range of learning materials, including **online**

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**repositories of scores, recordings, and research articles**, which support independent study and deepen their understanding of the repertoire. This wealth of resources has enhanced the learning process, enabling students to engage with music beyond the classroom and develop a more comprehensive understanding of their craft.

Despite these advantages, the integration of digital learning in music education has not been without challenges. One of the most prominent issues has been the **technological infrastructure** required to support effective distance learning. Music instruction, especially in ensemble settings, demands high-quality audio and video transmission to ensure that nuances in dynamics, phrasing, and tone are accurately conveyed. The **latency** that occurs in many online platforms can hinder real-time interactions, making it difficult for teachers to correct mistakes or for musicians to play in sync. Furthermore, not all students have access to the necessary equipment or a stable internet connection, creating disparities in the quality of learning experiences.

Another challenge has been the **adaptation of teaching methods**. Traditional conservatory training is built on the master-apprentice model, where the transmission of knowledge occurs through close, direct interaction between teacher and student. This model relies heavily on the non-verbal communication and physical presence that are difficult to replicate online. As a result, instructors have had to develop new pedagogical approaches that leverage the strengths of digital platforms while compensating for their limitations. For instance, many teachers have adopted a **flipped classroom** approach, where students review materials before class and then use synchronous sessions for focused discussion and practical application.



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Furthermore, the shift to digital and blended learning has prompted a **rethinking of assessment methods**. In traditional settings, performance exams and recitals are the cornerstone of music assessment. Online platforms, however, have required adaptations, such as the submission of video recordings or the use of live-streamed performances for evaluation. While these methods have enabled continuity, they have also introduced new questions about **assessment standards** and **the authenticity of performances**, as recorded submissions may allow for multiple takes and editing.

Despite these challenges, the experiences of European conservatories during the pandemic have highlighted the **resilience and adaptability** of music education institutions. Many have embraced the opportunity to experiment with new formats and to explore **innovative collaborations** across borders. Virtual exchanges and online masterclasses have allowed students to learn from international faculty, enriching their education with diverse perspectives. This cross-border approach has also facilitated **cultural exchange**, enabling students to interact with peers from different backgrounds and to participate in projects that span multiple countries.

Looking beyond the immediate context of the pandemic, the use of distance and blended learning is likely to remain a central feature of music education in the years to come. As institutions reflect on their experiences and continue to refine their digital offerings, there is a growing recognition of the **long-term benefits** of these methods. They offer greater flexibility, the potential for **hybrid learning models** that combine the best of both worlds, and the opportunity to leverage technology to enhance musical creativity and collaboration. The future of higher music education will likely involve a more **integrated approach**, where digital tools complement traditional practices, ensuring that students are well-equipped to navigate an increasingly interconnected world.

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This comprehensive overview of the evolution and current state of distance and blended learning in European music conservatories sets the stage for a deeper analysis of the data gathered through surveys. It explores how these technologies have been integrated into music education, the benefits they offer, and the challenges that must be addressed to ensure their effective use. As we transition to the analysis of survey data, we will delve into specific experiences and practices among music professionals, shedding light on how distance learning is being applied in various contexts and identifying best practices that can guide future developments.



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## Part 1

### 1.1 Historical Background

The integration of digital tools in music education has a long and evolving history, beginning with the early adoption of online repositories and basic audio-visual tools several decades ago. These initial efforts were primarily aimed at enhancing accessibility to educational resources, particularly for students who did not have direct access to extensive libraries or physical collections. Online repositories like Petrucci IMSLP and digital libraries provided unprecedented access to scores, recordings, and scholarly articles. This facilitated independent study and allowed students to explore a wider range of musical repertoire, significantly broadening their learning opportunities. These digital resources laid the foundation for a more expansive use of technology in music education, making it easier for students and teachers to access and share materials across geographic boundaries.

In the beginning, the use of digital tools in music education was largely supplementary. While traditional in-person lessons and rehearsals remained central to conservatory education, digital resources served as valuable support tools. For example, pre-recorded performances and instructional videos enabled students to observe technique and interpretation by renowned musicians, enhancing their practice routines. However, these resources were not yet integrated into the core teaching methods of conservatories, which continued to rely heavily on face-to-face interactions between instructors and students. This era marked the beginning of a gradual shift

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towards recognizing the potential of digital technologies in enriching music education, even though their application was still limited to non-interactive formats.

The transformation gained momentum over the past decade, particularly as online platforms, video conferencing tools, and digital collaboration technologies became more sophisticated and user-friendly. A critical turning point was the widespread availability of **high-speed internet** and the development of **high-definition video streaming** capabilities, which made real-time, interactive online learning feasible. Unlike the earlier phase, where digital tools served primarily as supplementary aids, the advent of **video conferencing platforms** like Skype, Zoom, and Microsoft Teams allowed for the creation of virtual classrooms, where teachers could interact with students in real-time. This development marked a significant departure from the traditional reliance on in-person instruction, as it enabled music educators to conduct live lessons, provide immediate feedback, and even coach ensemble rehearsals from a distance.

**Digital collaboration tools** have also played a crucial role in this evolution, particularly in enabling musicians to share and collaborate on musical works remotely. Platforms like Google Drive, Dropbox, and specialized score-sharing applications facilitated the **exchange of digital scores and audio files**, making it easier for students and teachers to work together on compositions and arrangements even when separated by distance. These tools also allowed for collaborative annotations and edits, which were especially valuable in educational settings where instructors needed to provide detailed feedback on students' work. As such, digital platforms transitioned from being static repositories of information to becoming dynamic environments that could support interactive learning experiences.

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This period also witnessed the emergence of **Digital Audio Workstations (DAWs)**, which brought new possibilities to music education. Applications like Reaper, Logic Pro, and Ableton Live enabled students to engage in music production, sound design, and recording techniques directly from their own devices. This was particularly influential in conservatories that began to offer courses in **electronic music, composition, and sound engineering**, fields that inherently required familiarity with digital tools. DAWs not only provided a platform for students to create and edit music but also allowed teachers to conduct online demonstrations of mixing, mastering, and sound manipulation, activities that were once confined to physical studios. This shift expanded the curriculum of many music institutions, allowing them to incorporate contemporary music practices into their offerings.

Another significant development during this time was the increasing use of **asynchronous learning platforms** in music education. These platforms allowed teachers to upload pre-recorded lectures, tutorials, and performance demonstrations that students could access at their convenience. Asynchronous learning proved especially useful for students who needed to balance their studies with professional commitments or for those in different time zones, enabling a more flexible approach to learning. Music theory, history, and even some aspects of ear training and analysis were particularly well-suited to this format. Additionally, the ability to **record performances and rehearsals** and review them later became an invaluable tool for both students and teachers, offering opportunities for self-assessment and detailed feedback.

The rise of **online masterclasses and workshops** further contributed to the digital transformation of music education. Prominent musicians and educators began offering online sessions, allowing students from across the globe to participate in learning experiences that were once limited to those

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who could attend in person. These virtual masterclasses expanded access to world-class instruction and enabled students to receive feedback from esteemed musicians without the need to travel. In many cases, this form of digital interaction fostered a sense of global community among students and educators, making the sharing of diverse perspectives and techniques possible.

One of the most notable impacts of this shift towards structured digital learning platforms was the development of **blended learning models** within conservatories. Rather than seeing online tools as a mere temporary solution, many institutions began to integrate them into their long-term educational strategies. In these models, core practical components, such as lessons on instrumental techniques and ensemble practice, remained in-person to preserve the tactile and immediate feedback necessary for musical development. Meanwhile, online tools were used to support theoretical learning, pre-rehearsal preparation, and the sharing of reference materials. This integration allowed conservatories to adapt their curriculum to include the advantages of digital tools without compromising the quality of hands-on training, particularly in areas like chamber music, where live interaction remains essential.

The growth of these digital tools has also been influenced by advancements in **audio streaming and networked music performance** technologies. Unlike earlier video conferencing tools that struggled with audio latency, newer platforms like Jamulus and JackTrip were designed specifically to address the needs of musicians by minimizing latency and enabling real-time musical collaboration. These innovations opened up new possibilities for **virtual ensemble rehearsals and performances**, where students could play together in a way that more closely resembled in-person interaction. While



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these technologies are still evolving and require a degree of technical expertise, they represent a significant step towards making online music education more interactive and effective.

As the capabilities of digital tools continued to grow, the perception of their role in music education also began to shift. While earlier attempts at integrating technology were often viewed as experimental or supplementary, the improvements in **connectivity, software sophistication, and user interface design** have made digital tools an accepted and, in many cases, essential part of the educational landscape in music conservatories. Institutions have increasingly recognized the potential of digital tools to **enhance student engagement, provide flexibility in learning, and support a broader range of pedagogical approaches**. This evolution reflects a broader trend across the education sector, where digital transformation is not just a response to external challenges like the pandemic, but a proactive strategy to improve the accessibility and quality of education.

In summary, the journey from early digital repositories to the sophisticated, interactive platforms used today represents a profound shift in the landscape of higher music education. The gradual integration of digital tools has evolved from a supplementary role to a central element of the learning process, reshaping how music is taught and experienced in conservatories across Europe. This historical perspective provides a critical context for understanding the current state of digital education in music and sets the stage for a deeper exploration of the specific ways these technologies are being applied in contemporary teaching practices. As we move forward, the next sections will explore how these advancements have been received by educators and students, and the impact they have had on the teaching and learning of chamber music in particular.

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## 1.2 Current Technologies

European conservatories today employ a diverse array of digital platforms and tools to facilitate distance and blended learning. These technologies have become integral to the educational infrastructure, enabling instructors to teach effectively, even when students and faculty are not physically co-located. The shift toward these tools has been driven by the need for flexibility, accessibility, and the ability to maintain high standards of musical instruction in a digital format. The following sections provide a detailed overview of the key technologies currently in use, highlighting their specific roles and the impact they have on the educational experience in the context of higher music education.

### Video Conferencing Tools

One of the most widely used technologies in music conservatories is **video conferencing software**, which has become a cornerstone of online music education. Platforms such as **Zoom**, **Microsoft Teams**, and **Framaestro** are among the most popular choices for hosting live teaching sessions. These tools facilitate real-time interaction between instructors and students, closely mimicking the dynamics of in-person lessons. For music education, where immediate feedback and active demonstration are essential, the ability to conduct live sessions has been critical.

Video conferencing enables teachers to demonstrate techniques, correct posture, and provide instant feedback on students' performances. It also allows students to ask questions and clarify doubts in real time, which is crucial for understanding complex concepts in music theory and performance practice. While these platforms have some limitations, such as issues with audio

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latency and the challenge of transmitting high-quality sound, many conservatories have adapted their teaching methods to work within these constraints. Some instructors use external microphones and audio interfaces to improve sound quality during sessions, ensuring that nuances in tone and dynamics are more accurately conveyed.

### Learning Management Systems (LMS)

In addition to real-time video interactions, **Learning Management Systems (LMS)** play a vital role in the structure of distance and blended learning programs. Systems like **Moodle** and **Blackboard** are commonly used to organize courses, distribute materials, and facilitate assignment submissions. These platforms allow for **asynchronous learning**, where students can access course content, such as pre-recorded lectures, readings, and instructional videos, at their own pace. This flexibility is particularly beneficial in music education, as it enables students to review complex topics multiple times and study independently without being bound to a fixed class schedule.

LMS platforms also provide a space for **discussion forums**, where students can engage with peers and instructors outside of live sessions, fostering a sense of community and collaboration. This aspect is crucial in a field like chamber music, where communication and interaction with other musicians are fundamental to the learning process. The integration of multimedia content within LMS platforms, including audio and video recordings, has further enriched the educational experience. Students can upload recordings of their practice sessions for critique, access reference performances, and participate in collaborative projects where each member contributes digitally recorded parts.



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## Digital Audio Workstations (DAWs)

**Digital Audio Workstations (DAWs)** are another pivotal technology in the digital toolkit of European conservatories. Tools like **Reaper**, **Audacity**, **Logic Pro**, and **Ableton Live** are frequently employed for courses related to **music production, sound engineering, and composition**. DAWs enable students to record, edit, and manipulate sound with precision, providing hands-on experience in the technical aspects of music creation. These platforms are particularly valuable in teaching **sound manipulation techniques**, such as mixing, mastering, and applying audio effects, which are essential skills for students pursuing careers in contemporary music production or audio engineering.

In addition to their use in production courses, DAWs have found applications in more traditional areas of music education. For example, they can be used to analyse recordings of classical performances, allowing students to study elements like phrasing, articulation, and dynamic contrast in detail. Instructors can use DAWs to create custom exercises and backing tracks, which students can then use for practice. The ability to visualize sound through waveform displays and spectrograms also aids in teaching **aural skills**, as students can correlate what they hear with visual representations of sound. This integration of DAWs into the curriculum has expanded the scope of what can be taught remotely, bridging the gap between classical music traditions and contemporary digital practices.

## Networked Music Performance Systems

A more specialized area of digital technology in music education is **Networked Music Performance (NMP) systems**. Tools like **Jamulus** and **JackTrip** have gained popularity for their ability to enable



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real-time, low-latency musical collaborations over the internet. These systems are designed specifically for musicians to rehearse and perform together remotely, addressing one of the most significant challenges of distance learning in music: **latency**. In a typical video conferencing platform, even a slight delay can disrupt the timing and coordination essential for ensemble playing. NMP systems, however, are optimized to reduce latency to a minimum, allowing musicians to synchronize their performances more accurately.

These tools have been particularly useful during periods when in-person rehearsals were not possible, allowing chamber music ensembles, orchestras, and choirs to continue practicing together despite being geographically dispersed. The use of NMP systems has also led to innovative formats for virtual concerts and collaborations, where musicians from different locations perform together in real time, streaming their performance to an online audience. This has opened up new possibilities for cross-border collaborations and has expanded the reach of conservatory performances, making them accessible to a global audience. Despite the technical challenges involved in setting up these systems, such as the need for stable internet connections and specialized audio equipment, the potential for creating immersive, real-time musical experiences has made them an invaluable addition to the digital toolkit of music educators.

### Score and Repertoire Repositories

Another essential digital resource in the realm of music education is the availability of **digital score and repertoire repositories**. Websites like **Petrucci IMSLP**, **MuseScore**, and other online libraries provide students and teachers with access to a vast collection of music scores, ranging from classical works to contemporary compositions. This accessibility has transformed the way students prepare

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for lessons and performances, as they can easily obtain scores that might not be available in their local libraries. The ability to **download, print, and annotate scores** electronically has streamlined the learning process, allowing students to practice with greater efficiency.

Digital repositories also support **independent study** by making a wide range of repertoire available for exploration, which is particularly beneficial in a chamber music context where students are encouraged to develop their own musical interests. Beyond just accessing scores, many repositories include **recordings, scholarly articles, and performance notes**, offering a more comprehensive resource for in-depth study. This wealth of material allows students to gain a deeper understanding of the historical and interpretative context of the pieces they are studying, contributing to a more rounded musical education.

Additionally, the ability to **share annotated scores** through these platforms has facilitated collaborative learning. Students can work together on digital scores, making notes and suggestions directly on the files, which can then be shared with peers and instructors for further feedback. This has proven particularly useful in ensemble settings, where members of a group need to coordinate their interpretation of a piece. Digital repositories have thus become an integral part of the **blended learning environment**, supporting both the technical and interpretive aspects of music study.

## Conclusion

The array of digital tools and platforms now available to European music conservatories has significantly transformed the landscape of higher music education. From real-time video conferencing and LMS platforms to advanced audio editing tools and networked performance systems, these technologies have enabled a more flexible, interactive, and accessible learning

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environment. They have not only provided solutions to the challenges posed by distance learning but have also enriched the educational experience by introducing new methods of collaboration and creativity. The effective use of these technologies has become a key factor in maintaining the high standards of musical training that conservatories are known for, ensuring that students receive a comprehensive education that prepares them for the demands of the modern music industry. As we delve deeper into the specific data collected from the survey, the following sections will examine how these technologies are being used in practice by educators and students, the challenges they face, and the potential for further innovation in the field of music education.



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### 1.3 Adoption of Blended Learning Models

Blended learning has emerged as a preferred approach in many European music conservatories, as it effectively combines the benefits of traditional, in-person instruction with the flexibility and accessibility provided by digital tools. This educational model, which integrates both face-to-face and online learning components, has proven to be particularly well-suited to the unique needs of music education. It allows institutions to leverage their strengths in delivering hands-on training while also embracing the possibilities offered by digital resources. By adopting this hybrid model, conservatories are able to meet the diverse learning needs of students, maximize the use of their resources, and maintain continuity in their educational offerings, even in the face of challenges such as those posed by the COVID-19 pandemic.

A key advantage of the blended learning model is its ability to maintain a **balance between practical and theoretical instruction**. In music conservatories, practical training—such as ensemble rehearsals, individual lessons, and performance practice—remains a cornerstone of the curriculum. These activities benefit greatly from the **immediacy and physical presence** of traditional instruction, where teachers can provide direct feedback on posture, technique, and sound production. This direct interaction is especially crucial in chamber music, where musicians must develop a deep sense of communication and cohesion with their peers. In a blended model, these core practical components are typically conducted in person, ensuring that students continue to receive the intensive, hands-on guidance necessary to refine their skills and develop as performers.



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Simultaneously, the blended learning model offers significant opportunities to **enhance theoretical and academic instruction** through online resources. Subjects such as **music history, theory, analysis, and even some aspects of composition** are particularly well-suited to online delivery, as they do not require the same degree of immediate, physical interaction as practical training. Online platforms allow instructors to deliver lectures, share reading materials, and create interactive exercises that students can access at their convenience. This flexibility enables students to engage with complex theoretical concepts at their own pace, review recorded lectures, and revisit key topics as needed, thus deepening their understanding of the subject matter.

The online component of blended learning also allows conservatories to **expand their educational offerings** beyond what is possible in a purely in-person format. For instance, students can participate in **virtual masterclasses, workshops, and guest lectures** from renowned musicians and educators around the world, who may not be available for in-person sessions. These opportunities broaden students' perspectives and expose them to a diverse range of styles and interpretations, enriching their overall musical education. Furthermore, the ability to access a wide array of **digital libraries, databases, and multimedia content** ensures that students have the tools they need to conduct independent research and explore new repertoire, supporting their growth as well-rounded musicians.

In addition to expanding academic content, the blended learning model has also proven effective in **facilitating peer collaboration and maintaining a sense of community** among students. Music education, particularly in areas like chamber music, relies heavily on the development of interpersonal connections and collaborative skills. By using **online discussion forums, collaborative**

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**platforms, and virtual rehearsal spaces**, conservatories can maintain this essential element of ensemble training even when students are not physically together. These digital tools provide a space for students to share insights, give and receive feedback, and discuss interpretations, fostering a sense of camaraderie that is critical for successful ensemble performance.

Moreover, blended learning allows for **greater flexibility in scheduling**, which is especially beneficial for students who balance their studies with professional engagements or other personal commitments. In the traditional conservatory model, students often face rigid schedules that can be challenging to accommodate alongside other activities. The integration of online components allows students to manage their time more effectively, accessing lectures and resources when it best fits their individual schedules. This is particularly advantageous for students who may be working musicians, as it enables them to pursue their education without having to sacrifice career opportunities.

This flexibility extends to instructors as well, allowing them to **adapt their teaching methods and tailor their approach** to the needs of individual students. For example, teachers can use online platforms to provide targeted resources to students who may need additional support in a particular area, such as advanced harmonic analysis or specific historical contexts of a composition. This personalized approach is more challenging to achieve in a traditional classroom setting but becomes possible through the blended learning model, where digital tools provide a way to supplement and enrich face-to-face instruction.



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The adoption of blended learning has also allowed conservatories to **optimize their use of physical spaces and facilities**. With some aspects of the curriculum being delivered online, conservatories can reduce the strain on rehearsal rooms, practice spaces, and lecture halls, allowing for better resource management. This is particularly important in institutions where physical space is limited, as it enables a more efficient allocation of rooms for activities that require in-person attendance. It also allows conservatories to accommodate **larger student cohorts**, as online lectures and workshops are not bound by the physical capacity of classrooms. This scalability is a key factor in ensuring that institutions can continue to meet the demand for high-quality music education without being constrained by infrastructure limitations.

While the blended learning model offers numerous benefits, its successful implementation requires **thoughtful integration and careful planning**. Conservatories must ensure that the online and in-person components of their programs are **cohesively aligned** so that students experience a seamless transition between different learning environments. This involves the development of **coordinated curricula**, where the skills and knowledge gained in online modules are directly applied and reinforced during in-person sessions. For example, students might study music theory concepts through online lessons, then apply this understanding in real-time during a face-to-face ensemble rehearsal. Such integration ensures that both aspects of the learning process complement each other, rather than existing as separate entities.

To achieve this integration, many conservatories have invested in **training their faculty** to effectively use digital tools and adapt their teaching methods for online instruction. This professional development has been crucial for instructors who may be highly skilled in traditional pedagogy but

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less familiar with digital platforms and online teaching strategies. By providing faculty with the skills they need to navigate both in-person and online environments, conservatories ensure that the quality of instruction remains consistent across all aspects of the blended learning model.

Another important consideration in the adoption of blended learning is the **evaluation of student progress**. Conservatories must develop **assessment methods** that accurately reflect students' abilities and achievements in both online and in-person contexts. This may involve a combination of traditional performance exams, video submissions, online quizzes, and digital portfolio reviews. The challenge lies in ensuring that these assessments are both **rigorous and fair**, providing a comprehensive view of a student's progress without being biased towards one mode of instruction over another. By creating a balanced approach to evaluation, conservatories can maintain their high standards of excellence while adapting to the new realities of blended learning.

Ultimately, the adoption of blended learning models has allowed European conservatories to **adapt to changing educational landscapes** while preserving the core values of music education. It has provided a framework for delivering high-quality instruction that is both **flexible and comprehensive**, combining the immediacy and personal connection of in-person lessons with the accessibility and breadth of online resources. This approach ensures that students receive a well-rounded education that prepares them for the multifaceted demands of a career in music, where digital literacy is becoming increasingly important.

As the landscape of higher music education continues to evolve, blended learning is likely to remain a central element of conservatory curricula. It offers a model that is resilient to disruptions, such as

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those seen during the pandemic, and capable of adapting to new technological developments. By embracing this model, conservatories are not only enhancing their capacity to deliver music education but also equipping their students with the skills they need to thrive in a rapidly changing world. As we move forward, the following sections will explore how educators and students have responded to these blended learning approaches, providing insights into best practices and areas for further innovation in the integration of digital and traditional teaching methods.



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## 1.4 Impact on Music Teaching

The adoption of digital technologies has brought about profound changes in teaching practices within music conservatories, reshaping how instructors engage with students and deliver instruction. The transition to distance and blended learning has opened up new possibilities for both educators and learners, creating opportunities to expand access to music education and to develop innovative pedagogical approaches that enhance the learning experience. These changes have had a substantial impact on how music is taught, especially in the highly specialized environment of conservatories, where personalized instruction and practical skills are of paramount importance.

One of the most significant impacts of digital learning methods has been the **expanded reach of music education**. Distance learning, enabled by video conferencing platforms and online course materials, has made it possible for conservatories to connect with students who are geographically distant or otherwise unable to attend in-person classes. This has proven particularly beneficial for students living in rural or remote areas, who might not have access to a nearby conservatory or music school. Through online instruction, these students can receive high-quality training without the need to relocate, broadening the pool of talent that conservatories can nurture. This shift towards a more **inclusive and accessible educational model** has allowed institutions to diversify their student bodies, fostering a richer and more varied learning environment.

Moreover, the flexibility offered by online learning has been advantageous for students who face **time constraints** due to work, family commitments, or other professional activities. For example, working musicians who wish to pursue further training can now attend classes without needing to

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take time off or compromise their professional engagements. This flexibility ensures that students at different stages of their careers can continue to benefit from conservatory-level education, contributing to their lifelong learning and professional development. The ability to participate in lessons, workshops, and masterclasses from anywhere has also made it easier for conservatories to engage **guest artists and lecturers** from around the world, enriching the educational experience with diverse perspectives and expertise.

In addition to expanding access, digital technologies have led to the adoption of **new pedagogical strategies** that enhance the effectiveness of music instruction. One such strategy is the **flipped classroom** model, which has become more common with the rise of blended learning. In a flipped classroom, students are provided with learning materials—such as recorded lectures, readings, or instructional videos—before attending live sessions. This allows them to engage with the content at their own pace, preparing themselves for more interactive and practical work during synchronous class time. The flipped classroom model has been particularly effective in music education, where theoretical knowledge can be reviewed independently, freeing up class time for **hands-on practice, discussion, and collaborative activities**. This approach not only deepens students' understanding of complex concepts but also encourages them to take greater responsibility for their own learning.

The shift to digital platforms has also transformed how **feedback is delivered** in music education. Traditionally, feedback in music lessons has been given in real-time, with instructors making corrections and suggestions during a student's performance. While this remains a valuable part of the learning process, digital tools have introduced additional methods for providing feedback that can be more detailed and reflective. Teachers can now record lessons and performances, allowing

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them to revisit specific moments in a student's playing or singing to offer more precise guidance. Students, in turn, can watch these recordings, identifying their strengths and areas for improvement. This approach enables a **more thorough analysis of technical and interpretive aspects**, such as intonation, phrasing, and dynamics, which might be difficult to address comprehensively in the flow of a live lesson.

The ability to record lessons has also led to the development of **digital portfolios**, where students can track their progress over time. By maintaining a collection of recorded performances, students can observe their own growth, recognize patterns in their playing, and better understand the areas where they need to focus their practice. This method of **self-assessment** encourages a deeper level of engagement with the learning process, as students become more active participants in their own development. It also allows instructors to have a more **evidence-based approach** to tracking student progress, using past recordings as a reference point for setting goals and measuring improvement.

Another significant impact of digital technologies on music teaching is the **ability to conduct remote ensemble rehearsals and collaborations**. While in-person rehearsals remain ideal for achieving precise musical coordination, especially in genres like chamber music, the use of tools such as **networked music performance systems** has made it possible for students to rehearse together even when physically apart. Instructors have adapted their rehearsal techniques to accommodate these tools, focusing on aspects of music-making that can be effectively managed online, such as discussing interpretative decisions, working on balance and blend through recordings, and breaking down complex passages into smaller sections for practice. This approach has kept ensemble training

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alive during periods when gathering in person was not possible, ensuring that students continue to develop the collaborative skills that are essential for a career in music.

Furthermore, digital technologies have enabled a **more personalized approach to instruction**. By using online platforms, teachers can tailor learning resources to individual students' needs, providing additional exercises, recordings, or readings that align with each student's specific challenges and strengths. For instance, a teacher might create a customized set of exercises focused on improving a student's rhythmic precision or provide links to recordings that exemplify different interpretative approaches to a piece. This level of **customization** would be more difficult to achieve in a purely traditional classroom setting, where time and resources are often limited. Digital platforms make it possible to extend the learning experience beyond the bounds of scheduled lesson times, offering students a richer array of materials to explore.

The digital shift has also led to new ways of **engaging students in creative projects**. With the availability of digital audio workstations and other recording tools, instructors can assign projects that involve students in the process of **recording, editing, and producing** their own performances. This not only helps students develop technical skills in sound manipulation but also encourages them to think critically about their musical interpretations and how they can be presented in a recorded format. Such projects are particularly valuable for students who are interested in careers in music production, composition, or multimedia art, as they provide practical experience that is directly applicable to the professional world.



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However, the integration of digital technologies into teaching practices has not been without challenges. Teachers have had to **adapt their instructional methods** to suit the online environment, which requires a different set of skills compared to traditional in-person teaching. For instance, maintaining student engagement during an online class can be more challenging, as the lack of physical presence may affect the energy and dynamism of interactions. To address this, many instructors have developed **interactive teaching techniques**, such as using breakout rooms for small group discussions, incorporating quizzes and polls to maintain student focus, and using multimedia content to make lessons more engaging.

Additionally, instructors have had to become proficient in using a variety of digital tools, from video conferencing software to audio editing programs, to ensure that they can provide a high-quality educational experience. This shift has required **ongoing professional development**, as educators learn to navigate the technical aspects of digital platforms while continuing to uphold the artistic standards of their teaching. Despite these challenges, the overall impact of digital technologies on teaching practices has been overwhelmingly positive, providing new avenues for creativity, accessibility, and student engagement.

The adoption of distance and blended learning has ultimately transformed the **role of the music educator**. Instructors have become not only mentors and performers but also **curators of digital resources, facilitators of online interaction, and guides for self-directed learning**. This evolution in the role of the teacher reflects the broader changes taking place in higher education as it adapts to the digital age. As conservatories continue to refine their use of technology, they are finding new



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ways to integrate the best of traditional pedagogy with the opportunities offered by the digital realm, creating a more dynamic and responsive learning environment for their students.

As we move forward, the next sections will explore the specific experiences of educators and students in adapting to these changes, drawing on survey data to provide a deeper understanding of the challenges and successes associated with the use of digital technologies in music teaching. The insights gained will help to identify best practices and guide future developments in the field, ensuring that the benefits of digital learning can be fully realized in the context of higher music education.

### Technological Barriers

One of the most pervasive challenges in the adoption of distance and blended learning is the **inequality in access to technology**. Not all students and instructors have the necessary resources, such as **high-speed internet, suitable devices, and high-quality audio equipment**, to fully participate in online learning. This disparity can create a divide between those who have access to the latest digital tools and those who do not, leading to inconsistencies in the quality of educational experiences. For students in remote or rural areas, where internet infrastructure may be less developed, participating in real-time online classes can be particularly difficult. Unstable connections can result in dropped calls, poor video and audio quality, and interruptions in communication, which can significantly affect the learning process.

These technological barriers also extend to the **quality of audio equipment** used during online music lessons. High-quality microphones, audio interfaces, and headphones are essential for ensuring that

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musical nuances are accurately captured and transmitted during remote lessons. However, these items can be expensive, and not all students or institutions have the resources to invest in them. As a result, the sound quality of online sessions can vary widely, impacting the ability of instructors to hear details in a student's playing or singing that would normally be evident in an in-person setting. This issue is especially critical in advanced training, where fine-tuning aspects of tone, articulation, and dynamics is central to the instruction process.

#### Latency and Sound Quality

Another major challenge in the digital transition is **latency**, or the delay in sound transmission that occurs during online interactions. Latency is a particular issue in music education because timing and synchronization are critical components of ensemble playing and instruction. Even a slight delay can cause **misalignment in rhythm** when musicians attempt to play together remotely, making it difficult to rehearse pieces that require precise coordination. This challenge has made it hard to replicate the experience of live ensemble practice in an online environment, where real-time feedback is crucial for developing the collective sense of timing and balance that is fundamental to chamber music and orchestral training.

**Sound quality** is also a significant concern. In many video conferencing platforms, the default audio settings are designed for speech rather than music, leading to **compression artifacts and distortion** that can affect the fidelity of musical sound. While some platforms offer settings to improve music quality, such as the "original sound" feature in Zoom, these options still cannot fully replicate the clarity and richness of sound that can be experienced in a live setting. This limitation can hinder both



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**instrumental and vocal lessons**, where subtle variations in tone and timbre play a critical role in interpretation and performance. Educators have had to find creative solutions, such as recording separate audio files and sharing them outside of live sessions, to work around these limitations, but this adds additional steps to the teaching process.

### Training Needs

The shift to digital teaching has also highlighted the need for **professional development and training** among educators. Many instructors, especially those who have spent their careers teaching in traditional settings, have had to learn how to use a wide range of **digital tools and platforms** effectively. This includes mastering the technical aspects of video conferencing software, audio equipment, digital audio workstations, and learning management systems. The process of adapting to these new tools can be time-consuming and may take instructors away from their primary focus of teaching music.

Moreover, the shift to online instruction requires a **reconsideration of pedagogical strategies**. Educators must find ways to engage students in a virtual environment, where maintaining attention and fostering interaction can be more challenging than in a physical classroom. This has led to a need for training in **online teaching methodologies**, such as how to create interactive lesson plans, use digital whiteboards, and integrate multimedia resources effectively. Some conservatories have offered workshops and support to help their faculty transition to online teaching, but the process remains a steep learning curve for many. However, the educators who have embraced these



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changes have often discovered new methods to enhance their teaching, leading to a more dynamic and flexible approach to music education.

### Opportunities for Innovation

Despite these challenges, the adoption of digital technologies in music education has opened up significant **opportunities for innovation**. One of the most promising aspects is the ability to **facilitate cross-institutional collaborations**. Digital tools allow conservatories in different countries to connect their students and faculty, enabling them to work together on **joint projects, virtual ensembles, and international workshops**. These collaborations enrich the learning experience by exposing students to diverse musical styles and pedagogical approaches, creating a more interconnected and globalized educational environment. For example, students from different cultural backgrounds can perform together in virtual ensembles, sharing their unique interpretations and learning from each other's musical traditions.

The use of **multimedia resources** in digital teaching also provides new ways to enrich the learning experience. Educators can incorporate **videos, animations, interactive scores, and audio recordings** into their lessons, providing students with a more immersive and varied approach to learning. For example, a teacher might use a video demonstration to illustrate a particular technique or provide audio examples of different interpretations of a piece. This multimedia approach allows for a more **multi-sensory learning experience**, which can help students better understand complex musical concepts and develop their own interpretations. The ability to **pause, rewind, and revisit** these



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resources also empowers students to study at their own pace, ensuring that they fully grasp the material before moving on.

Digital tools have also enabled the **creation of online archives and repositories**, where students and educators can access a wealth of educational materials, such as **recorded masterclasses, performance videos, and research articles**. These resources can serve as valuable references, allowing students to explore new repertoire, study the techniques of renowned musicians, and deepen their understanding of the history and context of the pieces they are studying. This access to a **broader range of resources** than might be available in a traditional classroom setting has made music education more accessible and inclusive, providing opportunities for self-directed learning and exploration.

In addition, the shift towards digital and blended learning has encouraged the development of **new pedagogical models** that combine the strengths of both online and in-person instruction. For instance, some conservatories have adopted **hybrid performance models**, where students rehearse together online and then gather for **live-streamed concerts or pre-recorded performances** that can be shared with a broader audience. These models have allowed students to continue developing their performance skills while also adapting to the realities of the digital age, where virtual performances have become an increasingly common part of the musical landscape.

Moreover, the digital shift has led to the **experimentation with innovative teaching formats**, such as **virtual reality (VR) and augmented reality (AR) in music education**. While still in the early stages, these technologies have the potential to create **immersive learning environments**, where students

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can interact with digital representations of musical instruments, virtual practice spaces, or historical reconstructions of concert venues. These experiences can offer a new dimension to the study of music, providing students with unique opportunities to engage with their art in ways that were not previously possible.

## Conclusion

The transition to distance and blended learning has undoubtedly presented challenges, but it has also opened the door to a wealth of opportunities that have the potential to transform the way music education is delivered. By addressing the **technological barriers** and **training needs** associated with online instruction, conservatories can leverage the **innovative potential of digital tools** to create a more flexible, accessible, and enriched learning environment for their students. The future of music education will likely involve a **blended approach**, where digital and traditional methods work in harmony, allowing students to benefit from the best of both worlds. As conservatories continue to refine their approaches and explore new technologies, the potential for creative and meaningful musical education remains as strong as ever, promising a bright future for the next generation of musicians. The following sections will delve deeper into how educators and students are navigating these challenges and opportunities, drawing on survey data to provide insights into their experiences and best practices.



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## 1.5 Case Studies

Several European conservatories involved in the In Media Stat Virtus project have been at the forefront of adopting digital teaching technologies, providing valuable examples of how to integrate distance and blended learning into music education. These institutions have navigated the challenges of the pandemic while leveraging digital tools to create sustainable teaching models that continue to benefit students. The following case studies highlight the approaches taken by partner conservatories, showcasing their best practices and the lessons learned throughout the process.

Italy: Conservatorio Giacomo Puccini, La Spezia (Scientific Coordinator)

As a key partner in the project, the **Conservatorio Giacomo Puccini** in La Spezia has implemented innovative strategies for maintaining high-quality music education during the transition to digital and blended learning. During the pandemic, the conservatory utilized various video conferencing platforms to continue **real-time lessons and ensemble rehearsals**, adapting their teaching methods to the online format. Recognizing the importance of maintaining practical training, the conservatory invested in **digital infrastructure**, including high-quality audio equipment, to support online instruction, ensuring that students and faculty could achieve the best possible sound quality during remote sessions.

One of the notable initiatives at the Conservatorio Giacomo Puccini was the development of a **blended learning model** that balanced in-person instrumental training with online theoretical courses. This model allowed students to continue their **ensemble practice and individual lessons** in person when restrictions permitted, while accessing lectures on subjects like music history, analysis,

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and composition through an online platform. The conservatory also introduced **asynchronous resources**, such as recorded lectures and practice materials, allowing students to study at their own pace. This approach not only ensured the continuity of learning but also provided students with valuable skills in **self-directed study**, preparing them for the demands of modern music education.

Belgium: Koninklijk Conservatorium, Bruxelles

The **Koninklijk Conservatorium** in Brussels has taken a proactive approach to integrating digital technologies into its curriculum, focusing on creating a comprehensive digital learning environment that supports both students and faculty. The conservatory developed an **extensive repository of recorded masterclasses, lectures, and performances**, providing students with a wealth of online resources to supplement their in-person studies. This repository became a critical tool during the pandemic, allowing students to continue their education remotely by accessing high-quality instructional materials at any time.

In addition to the repository, the conservatory emphasized **cross-border collaborations** with other European institutions, using digital platforms to host **joint workshops and virtual ensembles**. This approach enabled students to interact with peers and instructors from different countries, broadening their musical perspectives and enhancing their understanding of diverse styles. The **virtual masterclasses** offered by the conservatory brought renowned international artists directly into students' homes, providing a level of exposure and learning that might not have been possible in a traditional setting. These initiatives have helped to create a more **interconnected learning environment**, fostering a global perspective among students and preparing them for the increasingly international nature of the music profession.

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Hungary: Béla Bartók Music Institute, Miskolc

The **Béla Bartók Music Institute** in Miskolc has been a leader in adapting **digital audio tools and video conferencing platforms** for teaching composition, music theory, and performance. During the pandemic, the institute implemented **Zoom and Microsoft Teams** for online classes, ensuring that students could continue to receive high-quality instruction in their theoretical studies. The faculty used **digital audio workstations (DAWs)** such as **Reaper** and **Audacity** to support courses in **composition and sound design**, enabling students to work on their creative projects remotely and share their progress with instructors and peers.

The institute's approach included a focus on **individualized feedback**, using recorded lessons and performances as a basis for detailed critiques. Instructors could provide precise comments on students' compositions and performances, helping them refine their skills in a **self-reflective manner**. This method has proven particularly effective in developing students' technical and creative abilities, allowing them to grow as independent artists. By combining real-time interactions with recorded analysis, the Béla Bartók Music Institute has maintained the **rigor and depth of its instruction**, even in a digital format.

Romania: Academy of Music, Cluj

The **Academy of Music in Cluj** has been proactive in maintaining its high standards of education by embracing **blended learning models** that integrate digital and in-person instruction. During periods of restricted access to campus facilities, the academy relied on **video conferencing tools** to conduct live classes, ensuring continuity in subjects like **instrumental training and music theory**. The



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academy's faculty adapted quickly to the online format, using platforms like **Zoom** to deliver **interactive lessons** and providing students with **recorded practice sessions** to support their independent study.

One of the academy's key initiatives was the use of **digital platforms to host collaborative projects**. Students participated in **virtual ensemble performances**, where individual parts were recorded remotely and later combined using audio editing software. This approach allowed students to continue developing their skills in **ensemble playing** while adapting to the constraints of distance learning. Additionally, the academy implemented **virtual feedback sessions**, where students could present their recorded performances for critique, maintaining a sense of **community and shared learning** among peers and instructors.

Slovenia: Academy of Music, Ljubljana

The **Academy of Music in Ljubljana** has taken a holistic approach to digital education, focusing on the integration of **multimedia resources** into its teaching practices. The academy developed a **comprehensive online platform** where students could access **video lectures, interactive learning modules, and digital libraries**. This platform became a central part of the academy's strategy during the pandemic, providing students with access to a broad range of educational materials that supported both synchronous and asynchronous learning.

In addition to these resources, the Academy of Music in Ljubljana placed a strong emphasis on **cross-institutional collaborations**, partnering with other European conservatories to host **joint online workshops and masterclasses**. These events allowed students to learn from a variety of international instructors and to engage in **cultural exchanges** that enriched their musical education.

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The academy also encouraged the use of **innovative technologies**, such as digital whiteboards and interactive score analysis tools, to enhance the online learning experience and to ensure that students remained **engaged and active participants** in their education.

Spain: Conservatorio Superior de Musica A Coruña

The **Conservatorio Superior de Musica A Coruña** has been instrumental in utilizing digital technologies to support **composition, performance, and music production**. The conservatory implemented **digital audio tools** to deliver instruction in **electronic music and sound design**, using platforms like **Ableton Live** and **Logic Pro** to enable students to create and share their work remotely. These tools allowed for **collaborative projects**, where students could co-create compositions and experiment with new sounds and production techniques, despite the challenges of physical distance.

The conservatory also developed a **blended learning approach** that included **in-person lessons and online masterclasses**, ensuring that students could benefit from both the direct interaction of face-to-face training and the flexibility of digital resources. The online masterclasses featured **guest instructors from across Spain and beyond**, offering students insights into various musical styles and professional practices. This approach has provided students with a **well-rounded education**, combining the depth of practical training with the expansive reach of digital learning.

## Conclusion

These case studies from the partner conservatories involved in the In Media Stat Virtus project illustrate the diverse ways in which digital technologies have been integrated into music education.

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Each institution has developed strategies that align with their specific strengths and educational goals, from the **blended models** of the Conservatorio Giacomo Puccini in La Spezia to the **digital repositories** of the Koninklijk Conservatorium in Brussels. The **Béla Bartók Music Institute** in Miskolc and the **Academy of Music in Cluj** have shown how digital tools can support individualized feedback and remote ensemble practice, while the **Academy of Music in Ljubljana** and **Conservatorio Superior de Musica A Coruña** have highlighted the value of multimedia resources and cross-institutional collaboration.

Together, these examples demonstrate that with the right resources, training, and support, conservatories can successfully adapt traditional music instruction to a digital format. The experiences of these institutions provide valuable insights into best practices for maintaining **excellence in music education** in a digital age, offering a model for other conservatories as they navigate the evolving landscape of music teaching. As we move forward, the analysis of survey data will further explore how these practices are being adopted across the broader landscape of European music education, shedding light on the impact of digital technologies on teaching and learning.



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## Conclusion

The integration of digital technologies into the teaching practices of European music conservatories represents a profound evolution in the field of higher music education. This shift, accelerated by the challenges posed by the COVID-19 pandemic, has fundamentally reshaped the ways in which music is taught, learned, and experienced. By embracing **distance and blended learning**, conservatories have found ways to transcend **geographical barriers**, allowing students and instructors to connect and collaborate regardless of their physical location. This transformation has enabled a broader reach, ensuring that high-quality music education is accessible to students who may have previously been unable to participate due to distance, time constraints, or logistical challenges.

One of the most significant contributions of digital technologies has been the opening of **new avenues for pedagogical innovation**. Distance learning has prompted educators to explore creative methods for engaging students online, such as the **flipped classroom model**, the use of **multimedia resources**, and the implementation of **virtual rehearsal spaces**. These innovations have expanded the scope of what can be achieved in a music education context, offering a range of interactive and immersive experiences that complement traditional instruction. Blended learning, in particular, has emerged as a powerful model, enabling conservatories to combine the **practical benefits of in-person training** with the **flexibility and richness of digital content**. This hybrid approach ensures that students receive a well-rounded education, where the technical precision of performance training is supported by the depth of online resources.



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However, the journey towards integrating these technologies has not been without challenges. **Technological limitations**, such as unequal access to high-speed internet and quality audio equipment, have created disparities in the learning experience. **Latency issues** and sound quality concerns remain significant obstacles, particularly for ensemble practices that require precise timing and coordination. Additionally, the transition to digital teaching has highlighted the **need for continuous professional development**, as educators adapt to new tools and platforms. Conservatories have had to invest in training programs and technical support to ensure that their faculty can effectively navigate the online teaching environment.

Despite these hurdles, the adoption of digital and blended learning methods has proven to be a **valuable addition** to the traditional educational model. These approaches have not only provided solutions to immediate challenges but have also laid the groundwork for a more **flexible and resilient future** for music education. Digital tools have enriched the learning experience by offering students **on-demand access** to a vast array of resources, from recorded lectures to interactive scores, allowing for a deeper and more personalized approach to study. They have also facilitated **cross-institutional collaborations**, creating opportunities for students to engage with peers and instructors across Europe, broadening their musical perspectives and cultural understanding.

As conservatories continue to refine their use of digital technologies, the insights gained from these experiences will play a crucial role in shaping the future of music education. The success of these initiatives suggests that the integration of digital tools is not just a temporary adaptation but a long-term enhancement that can coexist with the core values of in-person instruction. This transformation reflects a broader trend towards **lifelong learning** and **digital literacy** in the arts,

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ensuring that students are prepared to thrive in a professional landscape where **technological proficiency** is increasingly important.

This introduction sets the stage for a deeper analysis of the data collected through the survey, which will provide a more detailed understanding of how these technologies are being applied in practice by educators and students. The analysis will explore the **practical applications of distance and blended learning**, the **challenges and successes** encountered in different teaching contexts, and the **impact on educational outcomes**. By examining these factors, the following sections will aim to identify **best practices** and **strategies for improvement**, offering valuable insights into how digital learning can continue to support and enhance the training of the next generation of musicians.



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## Part 2

To proceed with the analysis of the survey results, I will interpret the data provided, converting it into meaningful insights. This analysis aligns with the key questions from the survey and the main themes that emerged from the responses. Here's an outline of the approach:

- Demographic Analysis:
    - Nationality and Representation
    - Age Groups
    - Disciplines and Areas of Expertise
  - Experience with Distance Learning:
    - Adoption Rates of Distance Learning Methods
    - Preferences for Synchronous, Asynchronous, and Blended Approaches
    - Usage Frequency and Online Teaching Hours
  - Technological Readiness:
    - Internet Connection Types and Bandwidth Availability
    - Devices Used for Distance Learning
    - Commonly Used Digital Tools
  - Perceptions of Distance Learning:
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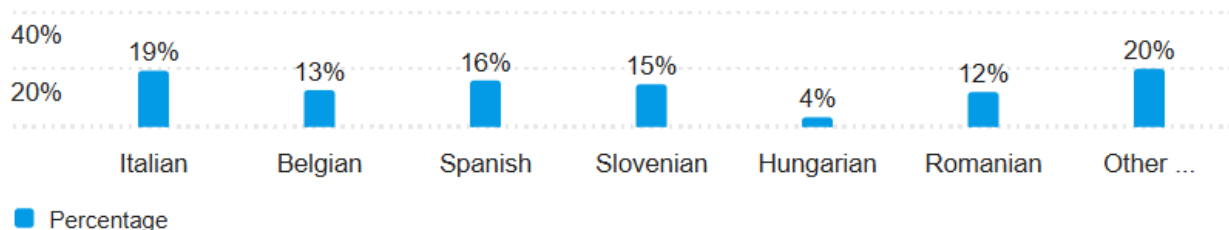
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- Challenges (e.g., latency, technological barriers)
- Perceived Benefits (e.g., flexibility, wider reach)
- Feedback on the Effectiveness of Distance Learning
  
- Future Directions and Recommendations:
  - Implications for Digital Tool Adoption in Conservatories
  - Potential Areas for Improvement and Investment in Technology

Let's begin with the first part of the analysis: **Demographic Analysis**. We will proceed with that and then move through each section step by step.

## 2.1 Demographic Analysis

### Nationality Distribution



The nationality distribution of the respondents reflects a diverse engagement with the project from a variety of European countries. The Italian respondents, who make up 19% of the total sample, represent a strong presence in the study, reflecting Italy's historical significance in the field of



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classical music education and the country's proactive involvement in digital learning initiatives. This presence highlights Italy's engagement with the digital shift in music education and its willingness to explore how digital tools can complement traditional teaching practices.

Following Italy, Spain accounts for 16% of the responses. The participation from Spain emphasizes its commitment to digital transformation in music education. Spain's growing adoption of distance learning tools aligns with its broader educational goals of enhancing accessibility and reaching students from diverse geographic and socioeconomic backgrounds.

The Belgium participation, representing 13%, underscores the international and collaborative nature of European conservatories. Belgium's involvement suggests a strong interest in digital education among its conservatories, and it may reflect efforts to maintain connectivity with the global music community, especially during times when in-person teaching has been limited.

Romania follows with 12% of the respondents, demonstrating that the adoption of distance learning tools is not limited to Western Europe. The involvement of Romania, despite its relatively smaller representation, indicates the expansion of digital education even in regions with varying technological infrastructure, further highlighting the universal appeal and potential of online music education.

Finally, Slovenia contributes 4%, and Hungary, with 4%, reflects the participation of smaller music education systems that are embracing innovative teaching models. These countries, though less represented in numbers, add to the richness of the survey's findings, indicating that the move

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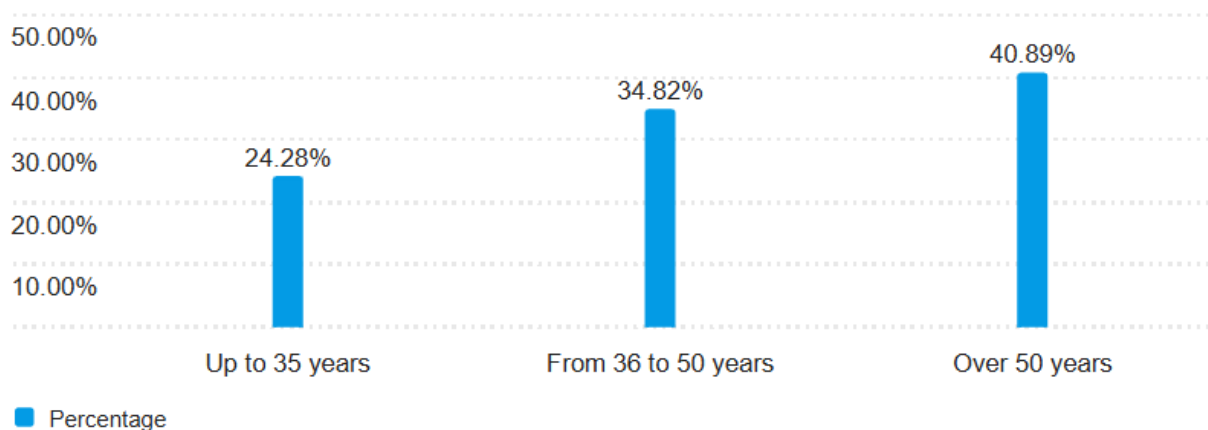


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toward digital music education is a broad European phenomenon, impacting countries with differing levels of resources.

### Age Group Distribution



The **age group distribution** of the survey respondents provides valuable insight into the level of **experience** and **adaptability** within the music education community regarding **distance learning**. The largest portion of respondents falls into the **over 50 years** category, comprising **40.89%** of the total responses. This suggests that a significant proportion of the participants are **experienced educators**, who have likely spent much of their careers teaching through traditional, face-to-face methods. The fact that this group is actively participating in digital learning initiatives highlights their **willingness** and **commitment** to embracing technological advancements in education, even after many years of established practice. Their engagement reflects a broader **shift** in music education, where educators of all ages are adapting to the evolving landscape of digital tools and platforms.



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The **36 to 50 years** age group, comprising **34.82%**, represents educators who are likely to have balanced experience in both **traditional** and **modern** teaching methods. This demographic is in a transitional phase, having likely witnessed the rapid integration of **digital technologies** in music education, particularly during the **COVID-19 pandemic**. Their active participation in the survey suggests a high level of **engagement** with **blended** and **distance learning** approaches, as they have witnessed first-hand the impact of these tools on the learning experience. This group plays a pivotal role in shaping the future of music education, as they possess a blend of **traditional pedagogical expertise** and **openness to innovative methodologies**.

The **up to 35 years** group, which comprises **24.28%** of the respondents, represents the **younger generation** of music educators and performers. This group is likely more accustomed to **digital technologies**, as they have grown up in an era where **technology** and **online resources** are integral parts of everyday life. The participation of this demographic in the survey indicates that they are keen on exploring and utilizing **digital tools** for **music teaching** and **learning**. Their strong familiarity with **online platforms**, **apps**, and **virtual collaboration** tools positions them as **innovators** in the field, capable of leading the way in integrating **new technologies** into music education.

Overall, the distribution of age groups in the survey indicates that **music educators of all ages** are actively participating in and benefiting from **distance learning**. It highlights a **cross-generational commitment** to evolving teaching practices and embracing the opportunities offered by **digital tools**. The diversity in age groups also suggests that **digital education** is not only for younger generations but is accessible and valuable for educators at various stages of their careers.

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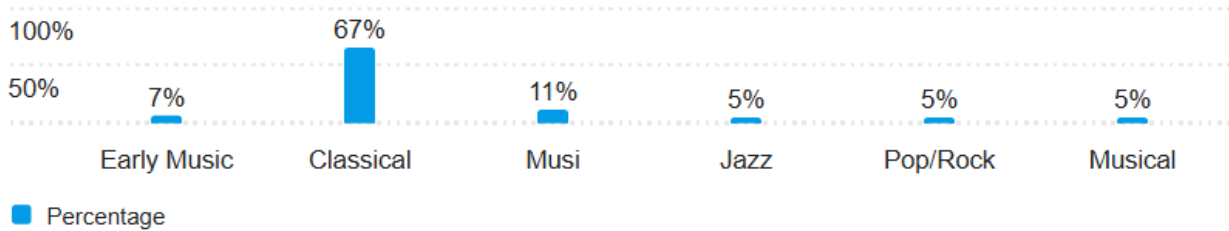


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## Discipline Distribution



The discipline distribution of respondents provides valuable insights into the areas of music education that are driving the adoption of digital learning tools. The most represented discipline is Classical Music, which accounts for 67% of the total responses. This high percentage reflects the deep-rooted tradition and significance of classical music education within European conservatories. The strong representation of classical musicians suggests that this field is leading the way in terms of adoption and integration of digital tools, which can be particularly valuable for instrumental teaching, ensemble work, and repertoire study. Classical music educators and students are likely to benefit greatly from online resources for score access, recorded performances, and the ability to engage in virtual masterclasses with renowned musicians.

The Early Music discipline, with 7% of the respondents, represents a smaller but dedicated group within the music education landscape. Early music often involves the study of historically informed performance practices, which require specialized knowledge of period instruments and techniques. The lower representation of Early Music in digital learning suggests challenges in adapting this genre



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to online formats, particularly in terms of maintaining the authenticity of performance. However, those involved in Early Music are likely exploring innovative ways to use digital tools for score access, historical research, and virtual performances, all while maintaining a deep commitment to historical accuracy.

Jazz, representing 5%, is another discipline that is adapting to digital learning environments. Jazz education often emphasizes improvisation, creativity, and real-time interaction, all of which can be challenging to replicate in an online setting due to issues such as latency and audio quality. However, the participation of Jazz educators suggests an interest in exploring ways that digital tools can support remote collaborations, virtual jam sessions, and composition workshops, offering new possibilities for engaging students in interactive learning.

Pop/Rock, representing 5%, reflects the growing integration of digital tools in popular music education. These genres benefit from digital audio workstations (DAWs), recording software, and online collaboration platforms. As the production-driven nature of Pop/Rock music lends itself well to digital methods, it is no surprise that educators in this field are increasingly incorporating digital tools into their teaching, allowing students to experiment with sound design, songwriting, and music production in a virtual space.

The Musical genre, also representing 5%, reflects a smaller but notable presence of educators in this field. While musical theatre education may present unique challenges in adapting to digital learning, educators are likely exploring online tools for performance-based learning, virtual rehearsals, and theatrical productions. This smaller representation may also suggest that musical theatre faces

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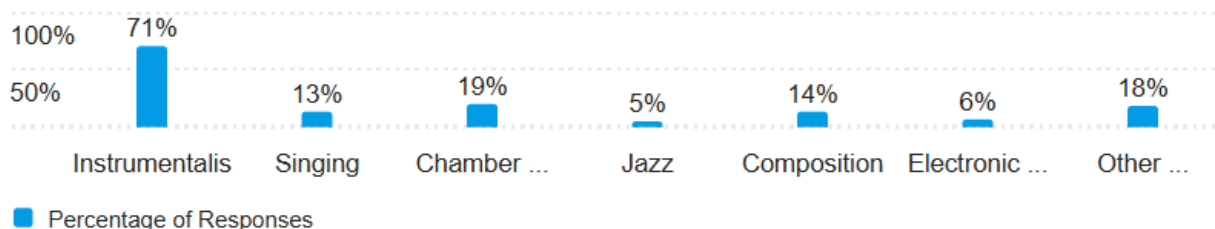


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different barriers to adopting digital learning compared to genres with more established online resources.

In summary, the discipline distribution in this survey indicates that classical music is the leading area of focus in the adoption of digital education tools in music conservatories, but the engagement of other genres like Early Music, Jazz, Pop/Rock, and Musical reflects a broadening interest in integrating distance learning and blended teaching approaches across various musical fields. This diverse representation highlights the potential for digital tools to be effectively applied across multiple genres, though each discipline may face unique challenges in adapting to an online learning environment.

## 2.6 Expertise Distribution



The expertise distribution of respondents reveals the diverse backgrounds and specializations that shape the adoption of **digital learning tools** in music education. A significant **71%** of the respondents identify as **instrumentalists**, indicating that the majority of educators and students participating in the survey are involved in **instrumental music**. This is consistent with the prominence of **classical music** in the field of music education, where **instrumental proficiency** is a central focus. The high



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representation of **instrumentalists** suggests that digital learning tools, such as **online tutorials**, **video lessons**, and **virtual masterclasses**, are becoming increasingly important in supporting the development of **technical skills** and **performance**. Digital platforms allow instrumentalists to **access expert guidance**, **revisit lessons**, and **receive feedback** remotely, offering flexibility and enhancing their learning experience.

The next largest group, comprising **19%**, is made up of those specializing in **chamber music**. Chamber music is a collaborative field, often requiring real-time interaction and coordination between multiple musicians. The relatively high representation of **chamber musicians** in the survey suggests that the adoption of **digital tools** is also relevant in this collaborative space. While **ensemble rehearsals** can be challenging to replicate online due to issues like **latency** and **audio quality**, the use of **virtual collaboration platforms** and **networked music performance tools** provides new opportunities for musicians to practice and perform together remotely. For chamber musicians, **distance learning** can provide flexible access to **repertoire**, **rehearsal recordings**, and **personalized coaching**, all of which contribute to **continued progress** even in challenging circumstances.

**Singing** comes next, with **13%** of the respondents identifying as **singers**. The involvement of **vocalists** in **distance learning** initiatives reflects the growing use of **digital platforms** to support vocal training. **Singing**, like instrumental music, requires **real-time feedback** and **vocal correction**, but the ability to access online resources for **vocal technique** and **performance** is expanding the learning possibilities for vocalists. This could include **virtual lessons**, **online voice training** apps, and **recorded performances** to allow students to refine their technique at their own pace.

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**Composition**, with **14%** of respondents, also represents a significant group. Digital tools for **composition** are increasingly being used in **music education**, where software like **digital audio workstations (DAWs)**, **score writing software**, and **collaborative composition platforms** allow students to create, edit, and share their compositions digitally. The rise of these tools is transforming how **composition** is taught, enabling students to **experiment**, **record**, and **revise** their pieces in ways that were previously not possible in traditional settings. Composition students benefit from the ability to access a variety of resources, collaborate with others, and receive real-time feedback on their creative projects.

**Electronic Music**, representing **6%** of the respondents, highlights the role of **technology** in contemporary music education. The growing field of **electronic music** is intrinsically tied to **digital tools** such as **MIDI**, **synthesizers**, and **software for sound design**. As electronic music continues to evolve, the integration of **digital platforms** into its education is crucial for staying up to date with the latest developments in **production**, **synthesis**, and **sound engineering**. For **electronic music students**, learning remotely can be an effective way to access **advanced tools**, **collaborate** on projects, and explore **new techniques** in **sound creation**.



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Lastly, the category labelled as **Other**, representing **18%** of respondents, suggests that there are many educators and students involved in a variety of other **musical disciplines** that may not fit neatly into the categories of **instrumental, chamber, vocal, composition, or electronic** music. This diversity within the survey population indicates a wide range of musical practices that are being integrated into the **digital learning landscape**. It is likely that these **specialized fields** are adopting **distance learning** tools in ways that are uniquely tailored to their needs, further highlighting the versatility and adaptability of **digital education**.

## Conclusion

This demographic overview provides a comprehensive foundation for understanding the varied backgrounds of the survey participants. The diversity in nationality, age, and discipline offers a well-rounded perspective on the different ways that distance and blended learning methods are being adopted across European music conservatories. By examining the range of experiences and expertise represented in the survey, we can better appreciate the complexities involved in adapting music education to the digital age. This foundation prepares us to delve into a deeper analysis of how these educators and institutions have engaged with digital tools, their experiences with distance learning, and the challenges and opportunities that have emerged as a result. The next sections will explore these aspects in detail, providing insights into the evolving landscape of digital music education.



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## 2.2 Experience with Distance Learning

### Distance Learning Experience



The survey results reveal that 84% of respondents have used distance learning in their music teaching, highlighting the significant role that digital tools and online platforms now play in music education across Europe. This high percentage suggests that distance learning has become a standard teaching approach for many educators, particularly after the rapid transition to online education prompted by the COVID-19 pandemic. The shift to remote teaching allowed many music educators to continue providing lessons, maintain engagement with students, and ensure the continuity of their programs when physical classes were disrupted. The adoption of online platforms has proven crucial in overcoming geographic and logistical challenges, especially for those teaching students who may be unable to attend in-person classes due to distance, time constraints, or health-related concerns.

The adoption of distance learning also reflects the broader trend within the music education sector to integrate technology and digital tools into teaching practices. This shift provides an opportunity for music educators to access online resources, share recorded lectures, engage with students



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through virtual classrooms, and create an interactive learning environment that can enhance the learning experience. Moreover, distance learning offers greater flexibility, allowing both students and instructors to adapt schedules to their personal needs, which can contribute to increased access to music education.

However, 16% of respondents reported not using distance learning in their music teaching, which may indicate that this approach has not yet been integrated into their teaching environments or practices. The absence of distance learning in their approach could reflect a preference for traditional face-to-face methods, especially for music performance, where immediate feedback, interaction, and hands-on guidance are essential. For some educators, the challenges of technology, including concerns over sound quality, latency issues, and the lack of physical presence, may have led them to maintain more conventional methods. Additionally, this group may work in settings where access to technology is limited, or where the infrastructure to support distance learning is not as robust, particularly in rural areas or smaller institutions.

The relatively low percentage of non-users underscores the dominance of digital education tools in contemporary music teaching. This suggests that even in fields like music education, where in-person interaction has traditionally been a cornerstone, there is a growing acceptance and recognition of the value of online learning platforms. As the adoption of distance learning continues to grow, further exploration of its long-term impact on music teaching methods, student engagement, and the quality of learning outcomes will be essential for shaping the future of music education in Europe.



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In conclusion, the high adoption rate of distance learning methods indicates a significant shift in the approach to teaching music, where digital tools are increasingly seen as a necessary complement to traditional teaching methods. As the music education sector moves forward, distance learning has the potential to enhance accessibility, flexibility, and global engagement for both educators and students alike.

#### Frequency of Using Distance Learning in the Context of Academic Activities



The results from the survey regarding the frequency of distance learning use in academic activities reveal an interesting split. 34% of respondents report using distance learning in the context of their academic activities, while a larger majority of 66% indicate that they do not regularly incorporate distance learning into their academic practices.

This 34% of respondents who do use distance learning in their academic activities suggests that a considerable portion of educators in European conservatories have integrated online tools and teaching methods into their regular teaching routines. These respondents may be those who have embraced digital pedagogy to enhance the flexibility and reach of their instruction, possibly offering online courses, blended models, or asynchronous learning opportunities. This indicates a strong



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desire to adapt and innovate, making education more accessible for students, particularly in subjects or skills that can be effectively taught in an online or hybrid format.

On the other hand, the 66% of respondents who report not using distance learning as a regular part of their academic activities suggest that there are still significant barriers preventing broader adoption. These barriers may include institutional constraints, such as limited infrastructure or the lack of institutional support for digital education. In many traditional and performance-focused music programs, hands-on teaching methods and in-person interactions remain central to the educational experience, particularly in ensemble work, individual performance coaching, and interactive workshops. These activities often rely on real-time feedback and direct interaction, which can be challenging to replicate in an online environment.

Additionally, this larger proportion of respondents not engaging in distance learning could also reflect cultural resistance to change, where educators, particularly those with extensive experience in traditional teaching models, may prioritize face-to-face engagement and value the tactile nature of in-person instruction. There might also be a perception that digital platforms cannot adequately capture the musical nuances and ensemble dynamics that are core to music education.

In conclusion, while there is an encouraging proportion of respondents incorporating distance learning in some form, the significant 66% who are not doing so highlights a need for more widespread adoption and training in digital teaching methods. It also indicates that the digital transition in music education is still a work in progress, with some institutions and educators needing more time, resources, and support to effectively integrate online teaching into their

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academic activities. This discrepancy could be addressed through targeted professional development and institutional initiatives that promote the use of digital platforms as complementary tools in music education, helping to bridge the gap between traditional and digital teaching environments.

### Evaluation of Overall Experience with Online Learning

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Music making	0.00	5.00	2.46	1.36	1.84	270	665.00
Rehearsing	0.00	5.00	2.14	1.23	1.50	269	576.00
Teaching	0.00	5.00	3.28	1.33	1.76	297	974.00

The average rating for music making in an online environment is 2.46, with a standard deviation of 1.36. This suggests that respondents had a moderate experience with online music-making, with responses spanning a broad range from 0 (the lowest possible score) to 5 (the highest). The standard deviation indicates significant variation in the experiences of the respondents, highlighting that while some found online music-making workable, others faced considerable challenges. The relatively low mean score of 2.46 implies that despite the widespread use of digital tools for music education, real-time collaboration and musical synchronization in a digital environment remain difficult to achieve effectively. Issues such as latency, sound quality, and the inability to replicate in-person ensemble dynamics likely contributed to these lower ratings. The variance of 1.84 further



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suggests that the experience of online music-making varies significantly, with some respondents perhaps finding it more useful or effective than others.

The average score for rehearsing online is slightly lower at 2.14, with a standard deviation of 1.23, indicating that while there is some variation in the responses, the general sentiment around virtual rehearsals is even less favourable than for online music-making. This lower score reflects the inherent challenges of real-time interaction in ensemble settings, where timing, coordination, and musical cohesion are essential. Latency and sound quality issues are particularly disruptive when trying to maintain the tight synchronization required in group rehearsals. With a mean score of 2.14, respondents suggest that online rehearsals are not fully replicating the interactive, dynamic environment of in-person rehearsals, which are crucial for ensemble training. The variance of 1.50 reinforces the idea that while some respondents may have been able to make online rehearsals work, the overall satisfaction was lower, with a notable proportion of participants encountering difficulties.

The mean score for teaching in an online setting is the highest of the three at 3.28, with a standard deviation of 1.33. This suggests that online teaching methods were generally perceived more positively than online music-making and rehearsing. With a higher mean score, it indicates that individual teaching or one-on-one instruction is more adaptable to online environments. Distance learning in theoretical subjects, composition, and individual performance coaching seems to work effectively, with educators able to provide feedback and guidance through video conferencing, screen sharing, and recorded sessions. The variance of 1.76 shows that while the overall response to online teaching is more positive, there are still some challenges and mixed experiences based on

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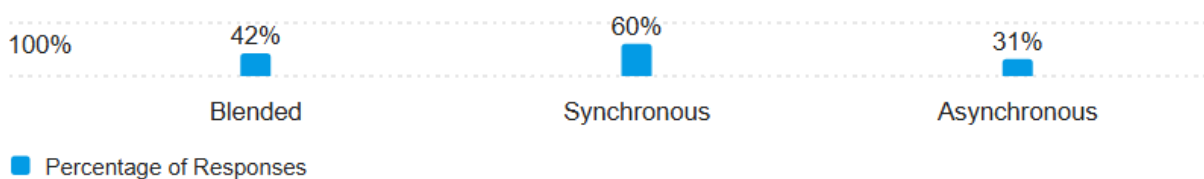
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individual teaching practices and access to digital tools. This indicates that online teaching can be quite effective, but like other aspects of distance learning, there is room for improvement, especially in terms of maintaining engagement and providing hands-on instruction in practical music settings.

In conclusion, the overall evaluation of online learning in the context of music-making, rehearsing, and teaching reflects the evolving challenges and opportunities of digital education in the music field. The moderate scores for music making (2.46) and rehearsing (2.14) highlight the difficulty of fully replicating ensemble dynamics and musical collaboration in an online setting, primarily due to latency and sound quality issues. In contrast, online teaching has received a higher rating of 3.28, showing that individualized instruction is more compatible with digital platforms. This suggests that while online learning is an essential tool in modern music education, it works best in certain contexts, such as one-on-one sessions and theoretical learning. To improve the experience in ensemble settings and music making, further advancements in digital tools, latency reduction, and sound optimization are necessary.

### Approach to Distance Learning



Among the various approaches to **distance learning**, **synchronous learning** emerges as the most preferred model, with **60%** of respondents indicating its use. Synchronous learning involves **real-**

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**time interaction** between instructors and students, often through video conferencing platforms like **Zoom** or **Teams**, where lessons, discussions, and feedback are conducted live. This approach replicates the **traditional classroom experience**, allowing for **immediate feedback, interaction**, and a sense of **community** among students and teachers. The preference for **synchronous learning** is particularly relevant in music education, where **real-time collaboration** and **feedback** are essential for enhancing performance skills, ensemble rehearsals, and other **interactive learning activities**. This method fosters a dynamic and engaging environment that helps **students stay connected**, making it easier to maintain a **sense of belonging** and **community** despite the challenges of remote learning.

The popularity of **synchronous learning** may also reflect the **urgent need** to maintain the **interactive aspects** of music education during the pandemic, especially in areas where **hands-on instruction** and **real-time performance** are key components of the curriculum. However, while **synchronous learning** offers significant benefits, it can also present challenges, such as the **technical requirements** for stable **internet connections, high-quality audio**, and **sufficiently powerful devices** to support live interactions. These demands can make synchronous learning less accessible to certain students, particularly in regions where **internet infrastructure** is insufficient.

**Blended learning**, which combines both **online** and **in-person** instruction, follows as the second most preferred approach, with **42%** of respondents adopting this model. Blended learning allows educators to leverage the flexibility of **digital tools** while still maintaining the essential **hands-on interaction** of traditional teaching. In music education, **blended learning** is particularly well-suited to subjects like **theory** and **composition**, which can be effectively taught using **online lectures** and

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**digital platforms for study materials and exercises.** At the same time, the **in-person component** of blended learning is crucial for activities like **ensemble rehearsals, instrumental coaching, and performance practice**, which rely heavily on face-to-face interaction. The integration of both elements allows institutions to **maximize resources**, offering students the flexibility to access lectures and materials online while still receiving the benefits of **direct instruction and group collaboration.**

The **preference for blended learning** reflects a desire among educators to **balance the flexibility and convenience of online learning** with the **interactivity and personal connection** provided by **in-person teaching.** It allows students to access **digital content** on their own schedule, while also benefiting from **live sessions** that provide real-time feedback and support. For **students in remote locations** or those unable to attend in person, **blended learning** offers a way to **maintain access to education** while still delivering **high-quality instruction** in both **theoretical and practical** aspects of music.

**Asynchronous learning**, where students access **pre-recorded materials** such as lectures and practice exercises, is the least popular method, with **31%** of respondents reporting its use. Asynchronous learning allows students to **study at their own pace**, reviewing materials and engaging with content according to their individual schedules. This approach is particularly useful for theoretical subjects, such as **music history, music theory, and score analysis**, which may not require real-time feedback. Asynchronous methods can be beneficial for students who need to balance **study time** with other **commitments**, as they can engage with course materials whenever it is convenient.



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However, **asynchronous learning** has some limitations in the context of **music performance**. In disciplines like **instrumental training** and **ensemble music**, real-time feedback is crucial for refining **performance techniques** and **collaborating with others**. Without **immediate interaction** with instructors or peers, students may miss the opportunity for **spontaneous musical exchange** and **refinement** that is vital to their learning process. The **lower adoption** of asynchronous learning in music education reflects this recognition of its limitations in areas where **real-time feedback** and **interaction** are essential for student development.

In conclusion, the analysis of **preferred approaches to distance learning** reveals the diverse ways in which **digital tools** are integrated into music education. **Synchronous learning** is clearly the most favoured method, as it maintains the **interactive** and **real-time nature** of traditional music instruction. However, **blended learning** also plays a significant role, offering a balanced approach that combines the best aspects of **digital flexibility** with the essential hands-on interaction required for music training. **Asynchronous learning** remains less popular but continues to offer valuable flexibility for theoretical studies and subjects that can be effectively taught without **immediate feedback**. These insights demonstrate the diverse needs of music educators and students, emphasizing the need for **adaptive teaching methods** that can cater to different learning styles and circumstances.



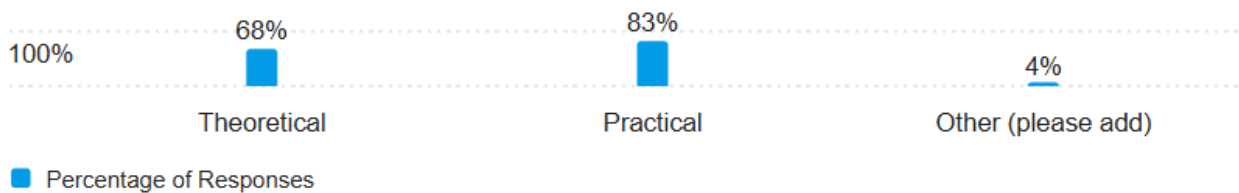
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### Used Approach (Technical or Practical)



The responses to the question about whether a theoretical or practical approach was used reveal a clear preference for practical learning, with 83% of respondents selecting this option. This strong preference for practical approaches highlights the hands-on nature of music education, which often requires direct interaction, real-time feedback, and physical engagement with instruments or voice. For many music educators, the practical approach is essential for developing technical skills, musical expression, and performance techniques, all of which are difficult to fully replicate in an online environment. The high adoption of practical approaches suggests that even in digital formats, educators prioritize active learning and the application of musical concepts in real-world contexts. The use of video lessons, interactive practice tools, and virtual collaboration platforms allows for this practical learning to continue despite the physical separation.

In comparison, 68% of respondents selected the theoretical approach. This reflects the fact that theory-based subjects, such as music theory, history, and composition, can be more easily adapted to online learning. Asynchronous modules and pre-recorded lectures are highly effective for delivering theoretical content, offering students the flexibility to engage with the material at their own pace. Theoretical approaches provide the necessary framework for understanding musical



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structure, history, and analysis, all of which are essential components of a well-rounded music education.

Finally, 4% of respondents selected Other, indicating a smaller proportion of educators who may have incorporated hybrid or integrative approaches, combining elements of both theoretical and practical teaching in their courses. This group may be exploring ways to blend both approaches, such as teaching theory alongside practical applications or using digital tools to support both theoretical learning and practical skills development.

In conclusion, the majority of respondents favour a practical approach to distance learning in music education, underscoring the importance of hands-on teaching methods in developing essential musical skills. While the theoretical approach remains important, especially for academic subjects, the preference for practical teaching reflects the unique nature of music education, where direct engagement with the material is key to student success. The small proportion of other responses suggests some experimentation with hybrid approaches, which could offer a more integrated learning experience for students.



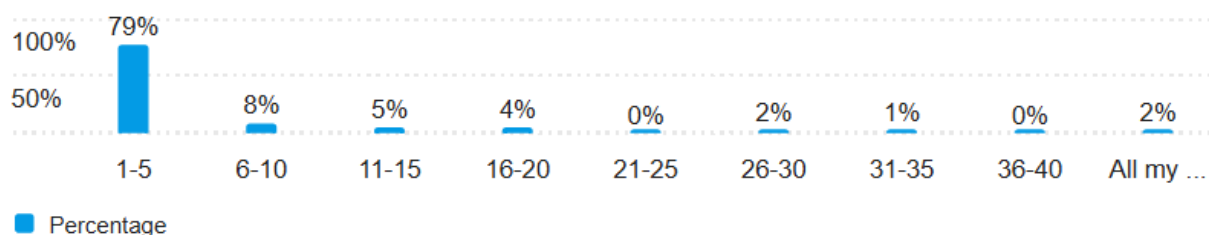
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## Weekly Online Teaching Hours



The data collected regarding the **weekly online teaching hours** reveals a clear trend in how educators are integrating **distance learning** into their overall teaching schedules. The largest group of respondents, **79%**, report teaching **1-5 hours** of online classes per week. This indicates that, for most educators, online teaching serves as a **supplement** to their traditional in-person instruction rather than a full replacement. These educators likely use **digital platforms** for **review sessions**, **extra practice exercises**, and **one-on-one lessons**, which allows them to extend their reach to students outside of regular class time without fully altering their primary teaching structure. This also suggests that online teaching is often used to address **specific needs**, such as **providing additional support** to students or teaching certain subjects that are more conducive to digital instruction, like **theory** or **compositional work**.

The next largest group, **8%**, of respondents teach **6-10 hours** online per week. These educators are integrating **distance learning** into their teaching practices to a greater extent, possibly offering additional lessons or workshops that are **online-only** or taking advantage of online tools for more **intensive** programs. These educators may be working with students in **remote areas** or offering more **specialized courses** that attract a broader geographic audience. This suggests that **online**



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**teaching** is becoming a more substantial part of their practice, but still likely complements **in-person** teaching sessions rather than replacing them entirely.

The remaining respondents report teaching **11-15 hours** (5%), **16-20 hours** (4%), and a very small proportion (2%) teaching **21-25 hours** or **26-30 hours** online per week. These percentages suggest that fully online teaching models, where the educator conducts the majority of their teaching virtually, remain relatively rare. The need for **in-person interaction**, especially in music education, where **real-time feedback**, **ensemble work**, and **performance practices** are essential, likely limits the amount of time educators are willing or able to spend in an online teaching environment.

The absence of respondents teaching **31-35 hours** or **36-40 hours** online per week suggests that **distance learning** is still seen as an extension of traditional teaching methods, rather than a complete replacement for in-person instruction. Even for those who spend more time teaching online, it is clear that **in-person interaction** remains a vital aspect of their teaching practice, particularly for performance-based disciplines like **instrumental music** and **ensemble work**.

Overall, the majority of educators teach a modest number of hours online, suggesting that **online learning** is increasingly integrated into music education, but still predominantly as a **complementary tool** rather than a full substitute for traditional in-person teaching. This pattern aligns with the broader trend of **blended learning**, where **online tools** enhance **classroom learning**, offering flexibility and additional resources without replacing the core structure of **face-to-face instruction**.



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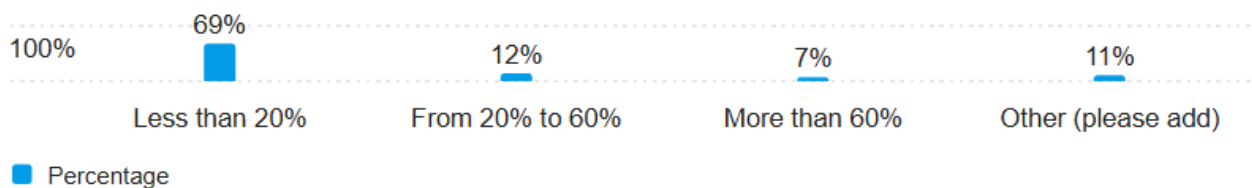




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On average, what percentage of your teaching time is done online?



The data regarding the percentage of teaching time spent online reveals a clear pattern in the way **online teaching** is integrated into the overall teaching structure.

- **69%** of respondents indicated that they spend **less than 20%** of their teaching time online. This majority suggests that for most music educators, **online teaching** serves as a **supplementary component** rather than a central aspect of their teaching practice. This aligns with the earlier findings that **online learning** is often used to **extend** or **enhance** traditional in-person instruction, rather than replace it entirely. Educators likely use **online methods** for tasks such as providing **extra practice exercises**, **recorded lessons**, or **theoretical instruction**, which can be more easily adapted to a digital format. However, the limited percentage indicates that **hands-on teaching**, particularly for **ensemble work** and **individual performance**, continues to rely heavily on in-person interaction.
- A smaller proportion, **12%**, report spending between **20% to 60%** of their teaching time online. This indicates that a subset of educators has **more fully integrated online teaching** into their **overall teaching strategy**. These instructors likely use **digital platforms** to deliver a significant portion of their **lessons**, possibly for both **theoretical courses** and **individual**



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**performance coaching**. The increased time spent online might also suggest that these educators are utilizing **blended learning models**, where students can access **pre-recorded lessons** and **online materials** outside of the classroom while participating in **in-person sessions** for **hands-on** aspects of their training.

- A very small portion, **7%**, spend **more than 60%** of their teaching time online. This group is likely made up of educators who have **embraced fully digital** or **hybrid models** of teaching, perhaps due to **geographical limitations**, **student needs**, or **institutional policies** that prioritize online learning. These educators may be teaching courses that are better suited to **remote delivery**, such as **theoretical subjects**, or they may be offering **specialized online programs** that cater to a broader audience beyond their local region.
- **11%** of respondents selected "**Other**", indicating a diversity of experiences that do not fit neatly into the above categories. This may include teachers who incorporate **online elements in unique ways**, such as **sporadic online interactions** or the use of **digital tools** for specific projects or activities, without dedicating a large portion of their teaching time exclusively to online instruction.

In conclusion, the data reveals that **online teaching** is still a relatively small component of most educators' overall teaching time. For the majority of respondents, **online instruction** accounts for less than **20%** of their teaching hours, reflecting its role as a **supportive tool** rather than a central teaching method. However, there is a **growing trend** toward **more substantial online engagement**, as indicated by the **12%** of respondents who dedicate between **20% and 60%** of their teaching time online. The **small percentage** (7%) who spend over **60%** of their teaching time online may be exploring more **innovative** or **specialized formats** of instruction. Overall, the results highlight the

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ongoing **blending of traditional and digital methods**, with **online teaching** complementing rather than replacing **in-person instruction** in the majority of **music education** settings.

## Conclusion

This detailed analysis of distance learning experiences among music educators highlights the diverse ways in which digital tools are being integrated into traditional teaching practices. The high level of familiarity with online instruction, combined with a preference for blended learning, suggests that many educators are embracing the flexibility offered by digital methods while also recognizing the enduring value of in-person interaction. The relatively limited hours of online teaching per week indicate a strategic use of these tools, aimed at supplementing rather than replacing face-to-face lessons.

This balanced approach is indicative of a thoughtful integration of digital resources that respects the unique demands of music education, where real-time feedback and live performance remain central to student development. As we move forward with this analysis, these findings provide a foundation for exploring how conservatories can continue to adapt their teaching models, leveraging digital tools to meet the evolving needs of students while preserving the rich traditions of their art forms.



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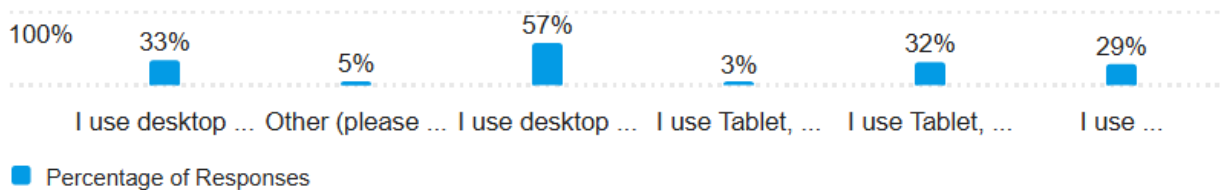


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## 2.3 Technological Readiness

How are your devices (PCs, Tablets, Smartphones...) connected to the internet?



The responses regarding how respondents' devices are connected to the internet reveal a variety of technological setups used by music educators for **distance learning**. The breakdown of these responses provides valuable insight into the tools and resources being used across different teaching environments.

The majority of respondents, **57%**, use **desktop PCs** to connect to the internet. This suggests that a significant portion of music educators prefer desktop computers due to their **higher processing power, larger screens, and stability** for tasks such as running **Digital Audio Workstations (DAWs)**, **video conferencing software**, and **score editing tools**. These advantages make desktop PCs ideal for handling complex **audio-visual** tasks and offering **high-quality interactions** during online lessons, especially in disciplines where **real-time feedback** is essential.



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A close second, **33%** of respondents use **laptops** for internet connection. Laptops provide greater **portability**, which is beneficial for educators who need to move between different teaching spaces or engage in **hybrid teaching models**. While laptops may not offer the same **processing power** or **screen size** as desktops, their flexibility and ability to adapt to **online** and **in-person teaching** make them an excellent choice for educators who value mobility.

Next, **29%** of respondents use **tablets**. Tablets are compact, user-friendly devices that offer significant **mobility** for teachers who need to quickly access teaching resources or **demonstrate concepts** to students during lessons. They are also ideal for **digital score viewing** and **recording audio or video snippets**. While tablets may not provide the same level of **performance** for more resource-intensive tasks, they are an effective tool for **asynchronous learning** and for teachers who want to engage with students in a flexible and accessible way. Their **touchscreen interface** is also convenient for quick interaction and can be particularly useful for **theoretical subjects** or providing visual aids during lessons.

**5%** of respondents report using **smartphones** to connect to the internet. Although smartphones are generally not the primary device for teaching, they are highly portable and can serve as convenient tools for **communication** with students and sharing **short instructional videos**. They are also useful for staying connected with students outside of class hours, whether to answer questions or provide **quick feedback**. However, smartphones are limited by **small screens** and the inability to run complex music software, making them less suited for intensive **live lessons** or activities that require detailed visual or audio work.



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Finally, **3%** of respondents use other devices to access the internet. This category likely includes various alternative setups that may combine different types of devices or custom configurations suited to specific needs. The relatively low percentage here suggests that while these devices may still play a role in **distance learning**, they are less commonly used than more mainstream options such as **desktop PCs, laptops, or tablets**.

In summary, the majority of respondents use **desktop PCs** and **laptops** for their **distance learning** activities, reflecting a preference for **stable, high-performance devices** for **teaching music**. **Tablets** and **smartphones**, while not the primary tools for online instruction, serve as valuable supplementary devices for **mobility, flexibility**, and accessing **digital resources**. The diverse range of devices used by respondents highlights the adaptability of music educators in utilizing available technology to meet the needs of their teaching environments.

In conclusion, the data shows that desktop PCs are the most commonly used device for internet access among respondents, reflecting the importance of reliable, wired connections for high-quality online learning and teaching. The use of tablets and smartphones also highlights the increasing portability of digital tools, although these devices may come with limitations for more complex tasks. The reliance on wireless connections among many respondents, especially for tablets and smartphones, suggests the need for improvements in internet infrastructure and more robust digital solutions to ensure reliable access to the tools and resources necessary for effective distance learning.

## Internet Connection Types

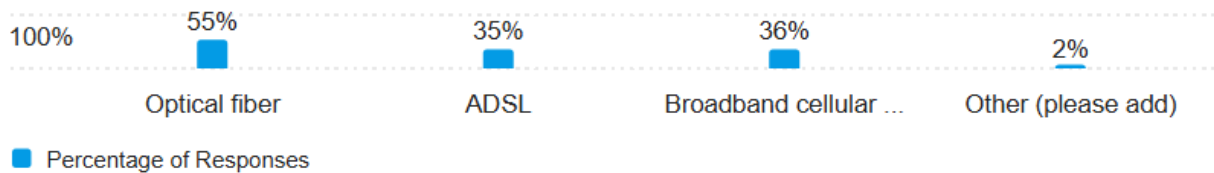
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The responses to the question about the type of internet connection used for distance learning provide valuable insight into the connectivity infrastructure available to music educators. The largest group, 55%, of respondents report using Optical Fiber connections. This is a positive indicator of the widespread availability of high-speed internet in many areas where music education takes place. Optical fibre offers fast, stable connections, which are crucial for real-time video streaming, online collaboration, and high-quality audio transmission during online lessons. For music educators, where latency and sound quality are essential, having a high-bandwidth connection like optical fibre ensures that lessons are delivered with minimal disruption and the highest possible quality. The high percentage of respondents using optical fibre suggests that many educators have access to infrastructure that can support high-quality distance learning.

Next, 35% of respondents report using ADSL (Asymmetric Digital Subscriber Line). While ADSL provides internet access, it is slower and less stable than optical fibre, especially when it comes to handling large amounts of data, such as streaming high-definition videos or transmitting high-quality audio for real-time interaction. For music education, where real-time feedback and sound clarity are essential, ADSL may present limitations, particularly in more rural areas where the quality of the connection may vary. However, ADSL still remains a common option in many areas where fibre optic infrastructure has not yet been fully implemented.



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36% of respondents use Broadband Cellular connections (4G or 5G), which provide internet access via mobile networks. While 4G and 5G offer relatively fast speeds and more flexibility in terms of location, they may not always provide the stability needed for high-quality audio and video lessons. In particular, 4G connections may experience latency or interruption issues during live sessions, which can significantly impact the quality of music instruction. However, the use of broadband cellular connections suggests that a considerable number of educators are working in environments where fixed internet connections (like optical fibre or ADSL) are not available, or where the flexibility of mobile internet is needed for remote teaching.

Only 2% of respondents use other types of internet connections, which may include satellite connections, Wi-Fi hotspots, or other alternative technologies. The relatively low percentage in this category suggests that these types of connections are less common among educators in this survey and may be used in specific, more isolated areas where other types of broadband access are not available.

In summary, 55% of respondents are using Optical Fiber for distance learning, reflecting the growing availability of high-speed internet in many regions. ADSL and Broadband Cellular connections follow as the next most common options, although they may present challenges in terms of speed and stability for high-quality teaching and real-time music collaboration. The results underscore the importance of reliable internet access in enabling effective distance learning, especially in a field like music education, where sound quality and interaction are critical.

## Internet Bandwidth

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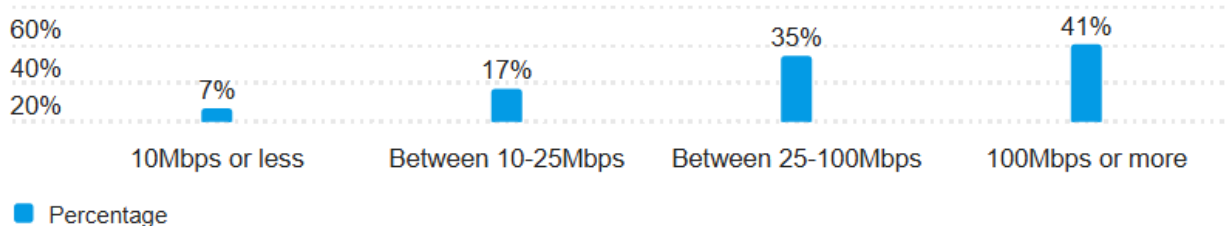


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The survey responses regarding the bandwidth of respondents' internet connections offer important insights into the quality and speed of internet access available to music educators for distance learning. The largest group of respondents, 41%, report having a bandwidth of 100Mbps or more. This is a very positive indicator, as high-speed internet is crucial for activities like real-time video streaming, online music collaboration, and sharing high-quality audio and video during distance lessons. With 100Mbps or more, educators can ensure smooth communication with students, deliver live feedback, and avoid the technical disruptions that may occur with slower connections. This high percentage suggests that many educators have access to stable, fast internet that supports the demands of online music education, which requires both audio fidelity and video clarity.

Following this, 35% of respondents have a bandwidth between 25-100Mbps. While this range may not be as fast as 100Mbps or more, it still provides a reasonable level of internet speed for conducting online music lessons. For video conferencing, file sharing, and asynchronous lessons, this bandwidth can accommodate standard video quality and audio streaming. However, during more intensive online collaborations, such as live ensemble rehearsals, educators might experience occasional challenges with latency or video/audio syncing. Nonetheless, this bandwidth range is



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generally sufficient for distance learning in music education, especially in more urban or suburban areas with relatively stable internet infrastructure.

A smaller group of respondents, 17%, report having a bandwidth between 10-25Mbps. While this is still sufficient for basic video conferencing and sharing educational materials, real-time music lessons may be impacted by latency and audio dropouts. In ensemble or instrumental lessons, these issues could interfere with the quality of instruction, particularly when trying to achieve synchronized playing or when high-fidelity audio is required. This bandwidth range may indicate that educators in more rural areas or those with less access to advanced internet infrastructure face more limitations in terms of internet quality.

The smallest group of respondents, 7%, report having 10Mbps or less. This connection speed is generally considered insufficient for high-quality video conferencing, live music collaboration, or streaming audio at high fidelity. For distance music education, this could present a significant barrier, particularly for real-time interactions that require smooth and synchronized audio and video. Teachers using such bandwidth may encounter frequent interruptions, delays, and low-quality sound, all of which could undermine the teaching experience and make it challenging to maintain student engagement and provide effective feedback.

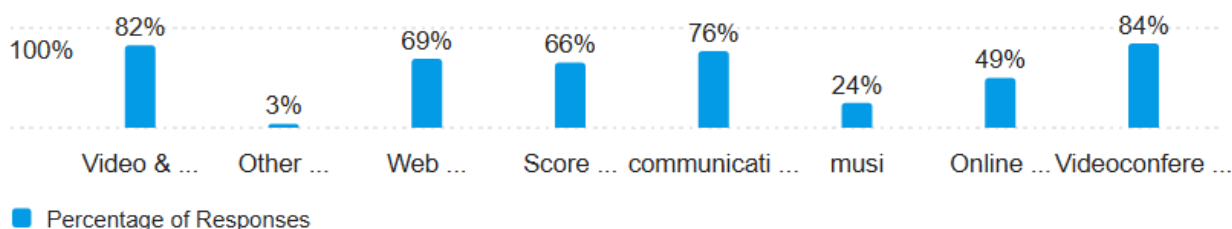
In conclusion, the majority of respondents report having adequate bandwidth for distance teaching, with 41% benefiting from the highest speeds of 100Mbps or more, and 35% operating with 25-100Mbps speeds. However, the smaller percentage of respondents with lower bandwidths (17% with 10-25Mbps and 7% with 10Mbps or less) highlights potential challenges in delivering high-quality music education online. The differences in internet speeds underscore the digital divide that



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may exist within certain regions, particularly between more urban areas with robust infrastructure and rural areas that still rely on slower connections.

### Digital Tools Usage (List A)



The responses regarding the digital tools used by respondents for distance learning reveal the key platforms and resources music educators rely on for teaching and engagement with students. Below is the detailed breakdown and commentary on each tool:

- 84% of respondents use videoconferencing platforms (e.g., Zoom, Microsoft Teams, Skype). These platforms are the most commonly used tools for real-time interaction between teachers and students. The high percentage indicates that live interaction is essential for synchronous learning, where direct feedback, discussion, and demonstrations are key components. This aligns with the critical need for real-time audio and video communication, especially in music education where feedback on performance is vital. Video conferencing tools have become a staple in distance learning, enabling educators to continue their courses without needing physical presence, ensuring that student engagement and interactive learning are maintained.



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- 82% use video & audio streaming services (such as YouTube, Spotify, Vimeo). These services provide a vast array of musical content, from performances to tutorials and lesson recordings. The use of streaming platforms allows for self-paced learning, where students can review and revisit materials outside of scheduled class time. The significant percentage reflects how asynchronous learning complements synchronous lessons, providing additional resources for students to explore at their convenience, which enhances their understanding and musical development.
  - 76% of respondents use communication tools like WhatsApp, Telegram, and Skype. These platforms facilitate ongoing communication between instructors and students outside of formal class hours. The use of these tools highlights the importance of maintaining connection and feedback in between lessons. Communication tools are particularly valuable for quick clarifications, personalized feedback, and fostering a sense of community among students, especially when social isolation can be a concern in digital learning environments. Their high use also underscores the flexibility of communication in distance education, allowing for more informal yet valuable interactions between educators and learners.
  - 69% of respondents use web-based repositories (like Google Drive, Dropbox, OneDrive). These platforms allow instructors to share resources, such as scores, audio recordings, and practice exercises. These tools facilitate the distribution of educational content and enable students to access teaching materials at their own pace. The widespread use of cloud storage solutions indicates that accessibility and collaboration are central to modern music education. Students can store, access, and share their progress, which enhances the learning experience outside of regular lessons.
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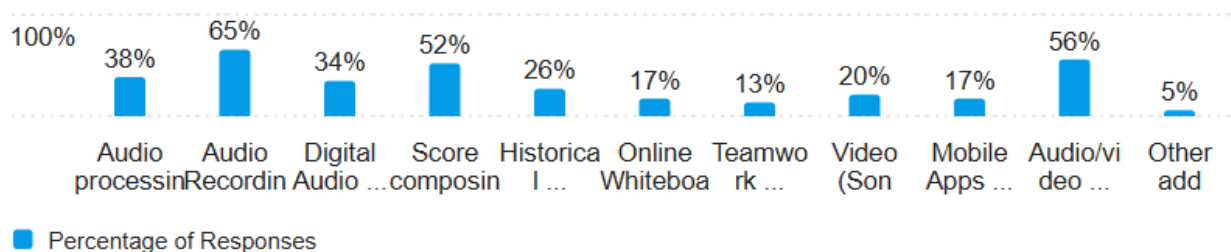
- 66% of respondents use score repositories (such as IMSDB, Petrucci, MuseScore). These tools provide access to a wealth of musical scores, making it easier for students to work with new repertoire and engage in self-directed study. The use of digital score repositories is particularly important in music education, where access to a wide range of historical and contemporary music is essential. The integration of these platforms helps level the playing field for students in remote or rural areas who might not have access to physical libraries or score collections.
- 49% use online collaboration tools (e.g., Google Docs, Slack, Trello). These tools support group projects and allow students to collaborate on musical assignments, track progress, and provide feedback. The widespread use of collaboration tools suggests that there is a significant emphasis on interactive learning and peer-to-peer engagement in music education. Online collaboration tools are especially useful for ensemble projects or joint composition tasks, where students need to work together remotely to achieve a common goal.
- 24% use Other tools not listed in the survey, which may include specialized music software, live streaming platforms, or other tools specific to the educators' teaching style or institution's needs. While this percentage is lower compared to other tools, it highlights the diversity of digital resources being used in music education. These other tools may include more specialized applications for audio editing, composition, or virtual performance spaces, which could cater to specific needs within music instruction. The fact that 24% of educators are utilizing other platforms or software suggests that music education is adapting to a wide



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range of technological tools, each addressing different teaching requirements and learning contexts.

### Digital Tools Usage (List B)

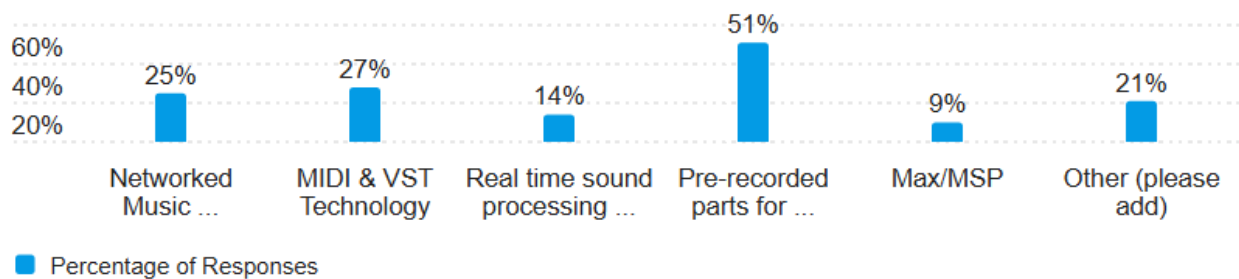


The adoption of digital tools in distance music education varies based on specific teaching needs. The prevalent use of audio recording tools (65%) and audio processing tools (38%) indicates a strong emphasis on producing and analysing musical recordings. Digital Audio Workstations (DAWs), utilized by 34% of respondents, are essential for creating and editing digital compositions. The adoption of score composition tools (52%) and historical score editing tools (26%) reflects the importance of maintaining the tradition of musical notation in digital contexts. The use of online whiteboards (17%) and collaboration tools (13%) facilitates real-time interaction between teachers and students. The adoption of video editing tools (20%) and mobile apps (17%) suggests a growing interest in multimedia content and accessibility via mobile devices. The combined use of audio/video processing tools (56%) highlights the significance of audiovisual content in distance music teaching. Finally, the "Other" category (5%) indicates the use of specific or customized tools for particular teaching needs.

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These insights provide an overview of the most utilized digital resources in distance music education, emphasizing the importance of tools that support musical production, analysis, and collaboration.

### Digital Tools Usage (List C)



**Pre-recorded parts (51%)** emerge as the most widely used tool, likely due to their versatility and essential role in modern musical and theatrical productions. This reflects the growing integration of live performances with pre-recorded content to create richer and more complex experiences.

**MIDI & VST Technology (27%)** also shows significant popularity, emphasizing the importance of virtual instruments and MIDI interfaces in today's musical landscape, both for production and live performance.

**Networked Music (25%)**, while less widespread, represents an emerging technology enabling remote collaborations, a trend boosted by the need for remote work during the pandemic.



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- **Real-time sound processing (14%)** and **Max/MSP (9%)**, more advanced and specific tools, cater to a niche of respondents. This suggests that their usage may be limited to professionals with advanced technical skills or experimental projects.
- **Other technologies (21%)** indicate the variety of tools not listed, underscoring the importance of flexibility and innovation in the sector.

**Suggestions for Interpreting the Data:** The distribution of responses can help identify priorities for training and technological development. The prevalent use of pre-recorded parts and MIDI/VST technologies suggests a need to strengthen competencies in these areas, while the interest in more advanced tools like real-time sound processing and Max/MSP highlights opportunities for innovation and experimentation.

## Conclusion

The analysis of internet connection types, bandwidth, and digital tools usage among music educators provides a detailed picture of the technological landscape within which distance learning takes place. The widespread use of Optical Fiber and higher bandwidths suggests a strong foundation for delivering **high-quality online instruction**, while the reliance on videoconferencing platforms highlights the importance of **real-time interaction** in maintaining the integrity of music education. However, the presence of educators with lower-speed connections and reliance on ADSL or cellular networks indicates that **connectivity challenges still exist**, particularly in regions with less developed digital infrastructure.



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By understanding these variations, institutions can better target **investments in infrastructure and training**, ensuring that all educators have the tools they need to deliver effective online lessons. Moreover, the diverse range of digital tools in use—from streaming services to communication apps—demonstrates the adaptability of music educators, who are leveraging a variety of platforms to meet the needs of their students. This adaptability is crucial for the future of music education, as it ensures that educators can continue to provide **engaging and flexible learning experiences**, regardless of their technical constraints. As we move forward, these insights will inform strategies for improving the **technological readiness** of conservatories, enabling them to harness the full potential of digital tools in their teaching practices

## 2.4 Quality of the experience

### Comment on Positive Experiences with Distance Learning

The responses to the question on **positive experiences** with distance learning in music education reflect a diverse range of benefits that educators and students have encountered. The comments highlight how digital learning has been able to address specific challenges in music education, particularly during the **COVID-19 pandemic**, while also bringing new opportunities for flexibility, accessibility, and learning enhancement.

One of the most significant positive aspects mentioned by respondents is the **convenience and accessibility** that online learning provides. Many noted that **distance learning** allowed students to **participate in masterclasses** and lessons without the need for extensive **travel**, saving both **time**

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and **money**. This reflects the **global reach** of online education, where students can access **high-quality instruction** from anywhere in the world. For example, one respondent mentioned the ability to engage in a **masterclass** without traveling to another country, enjoying **excellent sound quality** and the **visual experience** that mimics an in-person event. These experiences underscore the potential for **online learning** to democratize access to top-tier education, especially for those who face **geographical barriers** or have limited resources to travel.

Another commonly mentioned benefit was the **availability of recorded lessons**, which allows students to **revisit content** at their own pace, fostering a more **self-directed learning environment**. This flexibility in reviewing materials ensures that students can absorb complex concepts or difficult musical techniques at their convenience. The **customization** of lessons based on students' individual needs and preferences was also highlighted as a key advantage. Some respondents appreciated the ability to choose the **instruments** they wanted to learn, especially when local availability is limited, further emphasizing the potential of **online learning** to break down traditional barriers in music education.

The **familiar environment** of studying from home was another recurring theme. Many students reported feeling more **comfortable** and **less anxious** when studying in their own homes, which could lead to better focus and a more positive learning experience. This is especially important in music education, where **performance anxiety** can often impact students' progress.

Another positive outcome mentioned was the **increase in digital competencies** among both students and instructors. As a result of the shift to **online learning**, many have become more adept

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at using **digital tools**, which will likely serve them well beyond the pandemic. The **learning of digital tools** not only enhanced their **teaching** and **learning** experiences during the pandemic but also opened the door for ongoing innovation and development in **digital pedagogy**.

For educators, the ability to **provide personalized learning paths** for students was also seen as a significant advantage. The online format allows students to **learn at their own pace**, progressing through content as they master each concept. This ability to tailor the learning experience helps accommodate students with diverse needs and levels of musical proficiency, further enriching the learning process.

In terms of collaboration, many respondents emphasized how **online communities** and **virtual interactions** provided students with the opportunity to connect with **other musicians** and **students** globally. These interactions enabled **cultural exchanges** and **collaborations** that would not have been possible in a traditional classroom setting. The opportunity to engage in **cross-border collaborations** enhances students' musical education by exposing them to **varied musical styles** and fostering **international relationships** in the music community.

Lastly, **increased accessibility** for students with **disabilities** or **geographical limitations** was highlighted as another positive aspect of online learning. Distance learning can offer a more **inclusive** environment, allowing students with **special needs** or those in **remote locations** to access education in ways that traditional methods may not have been able to accommodate.

**In conclusion**, the positive experiences reported by respondents reflect a transformation in the landscape of music education facilitated by **digital technologies**. **Distance learning** and **blended**

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**models** have not only provided flexibility in terms of **time** and **location** but have also allowed for **personalized learning, increased accessibility, and global collaboration**. These benefits have played an essential role in maintaining educational continuity during the pandemic and are likely to continue shaping the future of music education as digital tools and platforms become more integrated into the teaching and learning process.

#### Comment on Negative Experiences with Distance Learning

The responses to the question on **negative experiences** with distance learning in music education highlight several challenges and limitations faced by both students and educators. While **distance learning** has proven beneficial in many ways, these responses underscore the difficulties in adapting to a completely online format, particularly in areas that require **direct interaction, real-time feedback, and hands-on engagement**.

One of the most significant issues raised by respondents is the **lack of real-time interaction**, which is central to many aspects of music education. One respondent mentioned that the experience “**does not feel real**” because it lacks the **interaction** and **momentum** that come from **face-to-face contact**. In traditional music education, the immediate **connection** between teacher and student, and the **in-person presence** that fosters learning, are crucial. Without these elements, some students find it challenging to remain engaged or to absorb the nuances of musical performance.

This sentiment is echoed by several others who reported **motivation problems**, particularly in the absence of physical presence. The **lack of environmental stimuli** that usually come with a classroom—such as the **presence of peers, direct engagement** with the instructor, and the **richness**

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of a collaborative environment—can lead to feelings of **isolation**. Many students struggle with **maintaining motivation** and focus when studying remotely, particularly in **practical subjects** like music performance, where the **hands-on nature** of learning is key. Without **peer interaction** or the ability to **observe** others in a group setting, students may feel disconnected from the community aspect of music education.

**Learning difficulties for beginners** were also frequently mentioned. Beginners, in particular, found it more **challenging** to learn to play an instrument without the **direct guidance** of a teacher. While online tools and resources can supplement learning, they often cannot replace the value of **immediate feedback** and **personalized instruction** that **in-person teaching** provides. For example, it is difficult for a teacher to correct **finger positioning**, **posture**, or **breathing techniques** via online instruction, which can impede the progress of beginners in particular.

Another major **concern** raised was the **difficulty in assessment**. Respondents noted that **accurately assessing** students without their physical presence was challenging, especially in a field as subjective and nuanced as music. This issue was compounded by the **lack of hands-on correction** during lessons and the inability to **directly observe** students' techniques. The **delay in feedback**, whether due to **audio lag** or **unstable internet connections**, further hindered the **assessment and correction process**, making it difficult for students to understand and improve their weaknesses effectively.

**Technical issues** were another prominent theme. Many respondents highlighted problems with **audio quality**, such as the **distortion** of sound, which can be especially problematic for music students. One respondent pointed out that **beginner students** often experience significant

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differences in how their sound is perceived during lessons, as **poor audio quality** can mask important aspects of their technique. Similarly, **audio delays** and **screen freezes** were noted as barriers to effective teaching. These technical limitations, particularly when coupled with **unstable internet connections**, can cause **disruptions** during online lessons, negatively affecting the **learning experience** and making it difficult to maintain the **flow** of the lesson.

Another issue is the **lack of access to necessary instruments**. Some students do not have the **musical instruments** required for their lessons, which presents a significant barrier to learning. This is particularly problematic for **instrumental education**, where the physical instrument is essential for practicing techniques, understanding sound production, and progressing in performance. Without the ability to use the proper instruments, students may feel frustrated and unable to fully engage with their studies.

Finally, **high digital competency** was identified as another challenge. Some respondents noted that the **high level of digital skills** required to successfully conduct **online lessons** or **virtual rehearsals** was a significant barrier. **Teachers** and **students** alike may need to develop **technical proficiency** to use new platforms and technologies effectively, and not all educators or students have the necessary skills or resources to do so. As one respondent put it, there are limitations on the quality of the final product, especially when faced with technological hurdles, and the current level of digital readiness may not be sufficient to meet the demands of online music education.

**In conclusion**, the **negative experiences** outlined in these responses emphasize the importance of **direct interaction** in music education, especially in areas such as **performance**, **assessment**, and

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**collaboration.** The challenges of **technical limitations, lack of access to instruments,** and **difficulty in engaging students** online highlight the gaps that still need to be addressed for distance learning to be fully effective in music education. While **distance learning** has proven valuable in certain contexts, these experiences show that **in-person education** remains crucial for delivering the full **quality** and **depth** of **music instruction.** The findings suggest a need for **improvements in digital infrastructure, teacher training,** and the **development of more accessible platforms** to ensure that the benefits of **online music education** can be fully realized without compromising the quality of learning.

## 2.5 Reflections and Future Perspectives

This analysis, focusing on the detailed interpretation of survey percentages, provides comprehensive insights into the demographic composition, experiences, technological readiness, and perceptions of distance learning among the surveyed group of music educators and institutions. The nuanced understanding of these aspects reveals patterns and trends that are critical for assessing the broader impact of digital tools and methodologies in European music conservatories. By delving into these statistical insights, we can draw conclusions about how well music educators have adapted to the digital transition and what challenges remain to be addressed for a more seamless integration of technology into music pedagogy.

These findings serve as a foundational basis for understanding how the adoption of distance and blended learning has influenced the traditional structures of music education, particularly in the context of specialized training environments such as conservatories. The demographic analysis

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provides clarity on who is participating in this shift—highlighting differences across age groups, disciplines, and geographic regions—which, in turn, informs us about the varied needs and preferences of different segments of the educational community. Understanding these distinctions allows for a more tailored approach to implementing digital strategies that resonate with the unique characteristics of each group.

Moreover, insights into the technological readiness of educators reveal the disparities in access to high-speed internet and advanced digital tools, which play a critical role in determining the effectiveness of online teaching and learning. These insights underline the importance of investing in digital infrastructure to ensure that all educators, regardless of their location or resources, can leverage the full potential of online platforms. The analysis of digital tools usage further illuminates how different technologies are being utilized, from videoconferencing platforms that support real-time interaction to audio streaming services that enable students to access a wealth of musical content.

Beyond the technological aspects, understanding educators' perceptions of distance learning—including their experiences with its benefits and challenges—helps to identify areas where additional support or training might be needed. For example, while many educators value the flexibility and reflective learning opportunities that digital tools provide, issues like latency, technological barriers, and limited interaction still pose significant hurdles that need to be addressed. Recognizing these obstacles is the first step toward developing strategies that can mitigate these challenges, such as creating specialized platforms for low-latency musical collaboration or offering targeted professional development to build digital competencies.



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As we move towards a future where digital integration becomes increasingly central to music education, it is crucial to reflect on the implications of these findings and to consider how they can guide the evolution of teaching methods, infrastructure investments, and policy decisions in conservatories across Europe. A forward-looking approach must involve not only addressing current gaps but also embracing innovative possibilities that digital tools can bring to the learning environment. This includes exploring new ways to connect students and educators across borders, enhancing the reach of educational programs, and fostering collaborative learning through digital means.

The shift toward a more digitally integrated model of music education presents an opportunity to reimagine the role of conservatories in the 21st century. By leveraging digital tools, these institutions can maintain their commitment to artistic excellence while also adapting to the changing needs and expectations of a new generation of learners. This involves balancing the time-honoured traditions of in-person musical instruction with the flexibility, accessibility, and innovation that digital platforms can offer. The findings of this analysis provide a roadmap for how this balance can be achieved, offering a strategic vision for the sustainable development of music education in a digital age.

In this context, the role of policy-makers, educators, and institutional leaders becomes paramount. They must work together to craft strategic initiatives that support the adoption of digital tools while also ensuring that equity, inclusivity, and quality remain at the forefront of educational reform. Policies that promote access to high-speed internet, subsidize digital tools for students, and support training for educators can help create a more level playing field, where all students have the opportunity to benefit from the advances in distance learning. At the same time, the cultural and

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artistic heritage of music education must be preserved, ensuring that digital tools enhance rather than replace the rich interpersonal dynamics that have traditionally defined the conservatory experience.

Ultimately, the integration of digital tools into music education is not a temporary adaptation but rather a long-term transformation that will shape the future of learning in conservatories. The insights derived from this analysis highlight the potential for growth and innovation, while also acknowledging the challenges that need to be addressed for a smoother transition. As conservatories embrace this digital evolution, they can continue to serve as pioneers of artistic training, blending the discipline and rigor of classical methods with the agility and creativity of digital learning solutions. By doing so, they will not only adapt to the current era but also lead the way in shaping the next chapter of music education for generations to come.

#### Enhancing Technological Infrastructure

One of the most critical challenges identified through this analysis is the disparity in internet connectivity and technological resources available to educators and students across European music conservatories. While Optical Fiber connections and high-speed bandwidth are accessible to a significant portion of respondents, providing them with the speed and stability required for seamless online instruction, a considerable number of educators and students still rely on ADSL or broadband cellular networks. These alternatives, while more widely available, often lack the reliability and speed necessary for high-quality distance learning, especially when it comes to synchronous music lessons that demand precise timing and real-time interaction. Inconsistent connectivity can result in audio dropouts, lag, and distorted video quality, which can undermine the

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effectiveness of online teaching sessions and make it difficult to maintain the standards of in-person instruction.

Addressing these disparities should be viewed as a **top priority** for institutions, **policy-makers**, and other stakeholders involved in the development of music education. The **unequal access to high-speed internet** can create significant **barriers to participation**, limiting the ability of students in rural or economically disadvantaged areas to benefit fully from distance learning opportunities. Without targeted efforts to close this gap, there is a risk of exacerbating **educational inequalities**, as those with access to better connectivity will be better positioned to take advantage of **digital resources and remote learning opportunities**.

**Investment in upgrading digital infrastructure** is essential to ensure that the **benefits of distance learning** reach all educators and students, regardless of their geographic location. This investment could include efforts to **expand access to high-speed internet** in **rural and underserved areas**, where **ADSL** or **broadband cellular connections** remain the only options. Initiatives like **subsidizing the installation of Optical Fiber networks** or providing **incentives for internet providers** to improve service in remote areas could make a significant difference. Such improvements would enable **stable, high-quality connections** that are crucial for the real-time audio and video transmission required in music instruction, especially for ensemble practice, virtual performances, and **interactive masterclasses**.

This goal could be achieved through **public-private partnerships** that leverage the **resources and expertise of technology providers** to support **educational initiatives**. By collaborating with **internet**

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**service providers (ISPs)** and **telecommunications companies**, conservatories and governmental bodies can work towards creating **affordable and accessible internet solutions** for educational institutions. Such partnerships could focus on developing **specialized service packages** tailored for music conservatories, ensuring that both teachers and students have the bandwidth needed to conduct and participate in high-quality online music instruction. Additionally, **grant programs** could be established to assist institutions in **upgrading their on-campus digital infrastructure**, equipping classrooms with **advanced streaming equipment** and **high-definition audiovisual systems** that enhance the hybrid learning experience.

Beyond improving access to internet connections, there is also a pressing need for the **development of dedicated digital platforms** specifically designed to support the **unique requirements of music education**. While general video conferencing tools have become widely used, they are not always optimized for the **low-latency, high-fidelity audio transmission** required for effective musical collaboration. To address this, it is essential to create platforms that integrate **low-latency audio software** with **high-definition video streaming capabilities**. Such platforms could be designed to **minimize delay** during virtual rehearsals and performances, ensuring that musicians can maintain **precise synchronization** even when they are physically separated.

These specialized platforms could incorporate **features tailored to the needs of music educators**, such as **multi-track audio recording**, **real-time score sharing**, and **interactive practice tools** that allow instructors to **annotate scores** and provide **immediate feedback** during online lessons. By focusing on the **specific challenges of music instruction**, these platforms could significantly enhance



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the quality of online teaching, making it possible for conservatories to offer **remote learning experiences** that closely approximate the **immersive, interactive nature** of in-person training.

To ensure the successful **adoption and use** of such platforms, it is crucial to provide **funding and training programs** that help educators and institutions transition smoothly to these new technologies. Many teachers, especially those who are less familiar with digital tools, may require support to effectively integrate **specialized software** into their teaching practices. **Workshops, webinars, and hands-on training sessions** could be organized to familiarize educators with the **advanced features** of these platforms, ensuring that they can make the most of the tools available to them.

Such training programs could also focus on **best practices for online teaching**, such as **optimizing audio settings** for different types of music, using **external microphones and interfaces** to improve sound quality, and managing **student engagement** in a virtual environment. By empowering educators with the skills and knowledge needed to deliver **high-quality online lessons**, these initiatives would help to **bridge the gap** between traditional in-person instruction and the digital realm, making it possible to maintain the **artistic standards** and **pedagogical rigor** that define conservatory training.

Ultimately, improving the **technological infrastructure** for music education is not just about addressing the **immediate challenges** of online teaching during the pandemic. It is about **laying the groundwork for a resilient and adaptable future**, where **digital tools** and **remote learning capabilities** are seen as integral components of a **modern, flexible education system**. By investing

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in **advanced internet connectivity**, **specialized platforms**, and **comprehensive training**, conservatories can ensure that they are prepared to continue delivering **world-class musical training** under a wide range of circumstances, whether through **blended learning models** or fully remote instruction.

In doing so, music education can become more **inclusive and far-reaching**, extending beyond the walls of traditional classrooms to connect with **students and educators across the globe**. This vision of a **digitally enabled conservatory** is one where **access to quality education** is not limited by geography, and where every student has the opportunity to develop their talents and **reach their full potential**, no matter where they are located. Through these strategic enhancements, the **rich traditions** of conservatory training can be preserved while embracing the **innovative possibilities** of the digital age. This approach will help ensure that the next generation of musicians is equipped not only with the **technical and artistic skills** required for their craft but also with the **digital literacy** needed to thrive in an ever-evolving world.

### Professional Development and Training

A central theme that emerged from the analysis of survey data is the critical need for ongoing professional development to equip music educators with the skills required to effectively navigate the digital landscape. The transition to distance and blended learning has introduced new challenges that go beyond traditional teaching methods, requiring educators to master a variety of digital tools, platforms, and pedagogical strategies. Many respondents highlighted technological constraints as a significant barrier, particularly a lack of familiarity with the tools and techniques needed to teach

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music effectively in an online setting. This underscores the importance of structured training programs that address these gaps, ensuring that educators are well-prepared to meet the demands of modern music education.

To effectively address these challenges, conservatories and educational networks should prioritize the development of comprehensive training programs that focus on the practical application of digital tools within the context of music education. Unlike generic digital literacy courses, these programs should be specifically tailored to the unique needs of music educators, offering targeted guidance on how to use technology to enhance their teaching practice. For example, workshops could be designed to teach educators how to use audio editing software such as Reaper or Audacity for recording and analysing student performances, enabling them to provide more detailed, technical feedback during online lessons. By mastering these tools, educators can create a richer learning experience that supports students in developing their technical skills as well as their artistic expression.

Moreover, training programs should include sessions on online classroom management, helping educators learn how to structure their virtual lessons, engage students during live video classes, and foster interaction in a digital space. This aspect of professional development is crucial for maintaining student engagement in an online environment, where the lack of physical presence can sometimes lead to reduced motivation and passive participation. By learning techniques for active learning, such as using polls, breakout rooms, and interactive digital whiteboards, teachers can make their online classes more dynamic and participatory, ensuring that students remain actively involved in their learning process.

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In addition to technical skills, these programs should focus on digital pedagogy—the art and science of teaching effectively in a digital environment. This includes understanding how to design asynchronous learning modules, such as pre-recorded video tutorials and online practice exercises, which allow students to work at their own pace and revisit challenging material as needed. Digital pedagogy also involves using assessment tools that enable educators to track student progress in real-time, providing timely feedback that helps students stay on track with their learning goals. By mastering these pedagogical approaches, educators can personalize their teaching, adapting their methods to meet the diverse needs of their students in a digital context.

Beyond formal training programs, there is immense value in fostering a culture of peer-to-peer learning among music educators. By creating communities of practice, where teachers can share their experiences, discuss challenges, and collaborate on solutions, institutions can facilitate the exchange of best practices in digital teaching. These informal learning networks allow educators to learn not only from expert-led workshops but also from their colleagues' lived experiences, which can be particularly valuable in a field as nuanced as music education. Such communities can be instrumental in helping educators adapt to new technologies more quickly, as they provide a supportive environment where teachers can experiment with new methods and receive constructive feedback from their peers.

For example, a community of practice might involve monthly online meetups where educators discuss topics like using virtual ensembles, integrating digital scores, or navigating latency issues during live classes. These discussions could be supplemented with online forums, where teachers can post questions, share resources, and exchange tips on the use of different software tools or

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teaching strategies. Such forums can serve as a repository of knowledge, growing over time to become a valuable resource for educators at all levels of experience.

Regular webinars can further enhance this peer-to-peer learning culture, offering opportunities for educators to hear from guest speakers who are leading innovations in digital music education. Webinars can focus on specific challenges, such as using MIDI technology in online composition classes or organizing virtual recitals that maintain a sense of performance etiquette and stage presence. These sessions can help to demystify complex digital tools and provide real-world examples of how other educators have successfully integrated technology into their teaching. By showcasing a variety of practical applications, webinars can inspire educators to experiment with new approaches and adapt best practices to their own contexts.

In addition, international conferences that explore the intersection of music and technology can play a pivotal role in keeping educators up to date with emerging trends and innovative practices. Conferences provide a platform for educators to present their own digital teaching projects, learn from the experiences of institutions in other countries, and network with colleagues who share a passion for advancing music education through technology. The knowledge gained from these events can then be brought back to the classroom, enriching the learning experience for students and ensuring that teaching practices remain cutting-edge.

By emphasizing continuous professional development through a combination of structured training, peer-to-peer learning, and ongoing engagement with the global community of music educators, conservatories can ensure that their teaching staff is well-equipped to meet the challenges of the

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digital era. This approach acknowledges that the shift to digital tools is not just a temporary adjustment but a long-term evolution in how music is taught and learned. As such, investing in the professional growth of educators is key to ensuring that they can thrive in this new environment and continue to provide students with the high-quality instruction they need to succeed.

Ultimately, the goal of these initiatives is to empower educators to become confident and capable digital instructors, who can harness the full potential of online platforms while preserving the artistry and personal connection that are at the heart of music education. By fostering a collaborative and supportive culture, where educators feel valued and equipped to navigate the complexities of digital teaching, conservatories can create a vibrant learning environment that meets the needs of both teachers and students. This holistic approach to professional development will ensure that the rich traditions of music education are maintained, even as they are enriched and expanded through the possibilities of the digital age.

#### Expanding the Reach of Music Education

One of the most promising aspects highlighted by this analysis is the potential for **digital tools to significantly broaden the reach of music education**, making high-quality training accessible to a **more diverse and geographically dispersed audience**. The ability of digital platforms to **eliminate physical boundaries** has introduced a fundamental shift in the **traditional conservatory model**, where students and teachers were often limited by the need for **in-person attendance** in a specific location. With the advent of digital technologies, this constraint has been greatly reduced, enabling



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conservatories to **connect with students** and **educators across different regions and countries**, regardless of their physical location.

This shift opens up a range of **exciting possibilities** for **cross-border collaborations**, which can greatly enrich the **educational experience**. For instance, conservatories can now organize **joint masterclasses** that bring together **renowned musicians** and **guest instructors** from around the world, offering students access to **specialized expertise** that might not be available locally. Such masterclasses can cover a wide array of topics, from **historical performance practices** to **innovative contemporary techniques**, providing students with a **broader perspective** on their art form. The digital format allows these sessions to be attended by students from multiple conservatories, fostering a **shared learning environment** that transcends national boundaries.

Additionally, digital tools have made it possible to create **virtual ensemble performances**, where students from various countries can **rehearse and perform together** in real-time or through **recorded collaborations**. These virtual ensembles can be a **powerful tool for cultural exchange**, allowing students to explore **different musical styles, interpretations, and traditions** from around the globe. For example, a virtual orchestra could combine **string players from Italy, woodwinds from Hungary, and percussionists from Spain**, each contributing their unique cultural background to a collective performance. Such projects can not only **enhance musical skills** but also foster a **sense of global community** among students, helping them to appreciate the **rich diversity** of the musical world.



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These **cross-border initiatives** can also play a crucial role in **enhancing cultural understanding** and **inclusivity** within music education. By participating in projects with peers from different backgrounds, students gain a deeper appreciation for the **variations in musical traditions** and **teaching approaches** that exist across cultures. This exposure helps to **broaden their artistic horizons**, preparing them to **adapt to different musical contexts** and collaborate with a variety of musicians throughout their careers. It also encourages a more **open-minded approach** to music-making, where students learn to **value diverse interpretations** and **experiment with new ideas**. Such experiences are invaluable in shaping **well-rounded musicians** who are capable of thriving in an increasingly **interconnected musical landscape**.

Looking to the future, conservatories have a unique opportunity to further explore the concept of **hybrid learning programs**, where students divide their training between **online sessions** and **in-residence experiences**. Hybrid programs can offer the **best of both worlds**, combining the **flexibility and accessibility** of online education with the **intensive, hands-on training** that is central to traditional musical instruction. In such a model, students could begin their studies online, taking advantage of **virtual lectures, tutorials, and practice sessions**, before traveling to the conservatory for **in-person lessons, masterclasses, and performance opportunities**. This would allow them to **develop foundational skills** at their own pace while ensuring that they receive the **high-level, personalized guidance** that only face-to-face interaction can provide.

The **hybrid model** is especially well-suited to the needs of **international students**, who might find it difficult to **relocate for extended periods** due to **financial, family, or professional commitments**. By offering a combination of **remote and on-site learning**, conservatories can make their programs

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more **accessible to talented students** who would otherwise be unable to participate. For example, a student from a rural area in Romania could begin their studies online, learning theory, composition, and analysis through **interactive video courses**. They could then travel to the conservatory for **intensive summer workshops**, where they would have the chance to **perform in ensembles, receive direct feedback from instructors, and engage with peers** in a collaborative environment.

This model also offers **significant advantages for educators**, who can use online platforms to **extend their reach and connect with a global audience** of students. Teachers can record their lessons, develop **asynchronous learning modules**, and offer **personalized online feedback** to students, allowing them to **scale their teaching** without being bound by the constraints of a physical classroom. At the same time, they can preserve the **in-depth mentorship** that is so essential to musical training by working with students **in person** during specific periods. This balance between **digital reach and personal interaction** ensures that educators can maintain the **quality and integrity** of their teaching while embracing new methods of **knowledge dissemination**.

Beyond individual learning benefits, **hybrid programs** can contribute to the **institutional growth** of conservatories by allowing them to **diversify their offerings** and attract a **more varied student body**. The ability to offer **flexible learning pathways** means that conservatories can adapt their programs to meet the needs of different types of students, from **young aspiring professionals** to **adult learners** looking to **enhance their skills**. By expanding their reach through digital means, conservatories can also **strengthen their international reputation**, positioning themselves as



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**leaders in innovative music education** that combines the **rich traditions of classical training** with the **opportunities of the digital age**.

Moreover, hybrid programs can serve as a **valuable bridge** between the **local and global dimensions** of music education. While conservatories can use online tools to **reach students worldwide**, they can also use their **in-residence periods** to highlight the **unique cultural heritage** and **musical traditions** of their own regions. For example, a conservatory in Spain could integrate **flamenco workshops** into its in-residence curriculum, offering international students a chance to **immerse themselves** in a style that they might not encounter in their home countries. This approach allows conservatories to **preserve their cultural identity** while simultaneously contributing to the **global music community**, creating a **learning environment** that is both **globally inclusive** and **locally grounded**.

As conservatories continue to explore these possibilities, it will be important to **invest in the necessary digital infrastructure** to support **high-quality hybrid learning**. This includes not only **high-speed internet** and **state-of-the-art streaming platforms** but also the development of **virtual performance spaces** and **collaborative online tools** that can replicate the **experience of playing together** in a shared space. By doing so, conservatories can ensure that their hybrid programs offer a **seamless learning experience**, where students feel equally engaged whether they are participating **online or in person**.

In conclusion, the expansion of digital tools presents a **transformative opportunity** for music education, one that allows conservatories to **reach beyond their walls** and create a **truly global**

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**classroom.** By embracing **cross-border collaborations**, **hybrid learning models**, and **culturally enriched curricula**, conservatories can offer their students an **education that is both deeply rooted in tradition and forward-looking**. This approach ensures that the **richness and diversity** of the world's musical heritage is available to all, enabling students to develop as **well-rounded artists** who are ready to thrive in a **globalized musical world**. As these initiatives continue to evolve, they will play a key role in shaping the **future of music education**, making it more **accessible, inclusive, and innovative** than ever before.

#### Addressing Equity and Accessibility

While the shift to digital learning has introduced numerous benefits to music education, such as greater flexibility, expanded reach, and enhanced opportunities for collaboration, it has also highlighted pressing issues of equity and accessibility. The transition to online learning has made it clear that not all students have the same access to the necessary technology, and that financial constraints and unequal distribution of resources can create significant barriers to participation. These disparities can impact students' ability to fully engage in distance and blended learning, limiting their access to high-quality instruction and online resources. To ensure that digital education is truly inclusive, it is essential to identify and address these barriers, making sure that no student is left behind due to a lack of resources or support.

One of the primary challenges identified in the analysis is the financial burden associated with acquiring the hardware and software needed for effective online learning. Many students may struggle to afford laptops, tablets, microphones, cameras, and other audio-visual equipment that

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are crucial for participating in virtual music lessons and online rehearsals. For those from low-income families or economically disadvantaged backgrounds, these costs can be prohibitive, preventing them from fully benefiting from the digital transition. To address this, conservatories and funding bodies should consider developing scholarship programs specifically aimed at helping students acquire the necessary devices and software licenses. Such programs could provide grants or loans that allow students to purchase high-quality equipment, ensuring that they can access the same learning opportunities as their peers.

In addition to scholarships, there is a need for institutional support to ensure that students have access to professional-grade digital tools that may otherwise be beyond their reach. For example, conservatories could partner with software companies and tech providers to create subsidized access to digital audio workstations (DAWs), score-editing software, and virtual collaboration platforms. By negotiating discounted rates or providing institution-wide licenses, conservatories can ensure that all students, regardless of their financial background, have access to the same high-quality tools that are essential for digital music production and online collaboration. This approach would help to level the playing field, making it possible for students from underrepresented backgrounds to engage fully in the learning process and to develop their digital literacy alongside their musical skills.

Beyond financial support, linguistic and cultural inclusivity is another crucial aspect of making digital education more equitable. Many students come from diverse linguistic backgrounds, and for some, language barriers can make it difficult to navigate digital platforms or to understand online instruction. To address this, institutions should focus on developing multilingual resources for their

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online learning platforms. This could involve providing subtitles and translations for recorded lectures, allowing students to access content in their native languages. For example, a recorded masterclass in Italian could be made accessible to Spanish-speaking students through subtitled translations, enabling them to engage with the material more effectively. By offering multilingual support, conservatories can ensure that language does not become a barrier to accessing valuable educational content.

In addition, accessibility for students with disabilities is a critical component of inclusive digital education. The shift to online learning offers unique opportunities to make content more accessible through assistive technologies. For instance, digital platforms can be adapted to support screen readers, enabling students with visual impairments to navigate course materials, participate in online discussions, and access digital scores. Institutions should also consider providing audio descriptions for video content and closed captions for live-streamed events, ensuring that students with hearing impairments can fully engage in online masterclasses, performances, and interactive sessions.

Furthermore, the development of flexible digital interfaces that are easy to navigate is essential for creating a user-friendly learning environment. This includes designing platforms with clear, intuitive menus, adjustable font sizes, and high-contrast text options to accommodate students with cognitive or visual challenges. By prioritizing these features, conservatories can ensure that their digital tools are accessible to a wider range of users, allowing all students to focus on their learning without being hindered by technical difficulties. This approach also aligns with the principles of



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Universal Design for Learning (UDL), which emphasizes the creation of inclusive educational environments that are designed to meet the diverse needs of all learners from the outset.

In addition to the technical and financial aspects of accessibility, there is a need to consider the social and psychological impacts of digital learning on underrepresented students. The shift to online education can sometimes lead to feelings of isolation and disconnection from the school community, particularly for students who are accustomed to the social interactions and support networks that exist in in-person settings. To mitigate this, conservatories should focus on creating virtual support groups and online mentoring programs where students can connect with peers, seek guidance from faculty, and share their experiences. These initiatives can help to rebuild a sense of community within the digital space, ensuring that students feel valued and supported even when they are learning from a distance.

Moreover, the integration of cultural sensitivity training for educators can play a significant role in fostering a welcoming and inclusive online environment. By equipping teachers with the skills to recognize and address cultural differences, conservatories can ensure that all students feel respected and included in the digital classroom. This could involve training on inclusive communication strategies, understanding diverse learning styles, and being mindful of cultural references that may not be familiar to all students. By fostering an environment of mutual respect and understanding, educators can create a positive learning experience that supports the well-being and academic success of every student, regardless of their background.



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Developing partnerships with community organizations and non-profits can also enhance efforts to address equity and accessibility. These partnerships can provide additional resources and support to students who may face economic or social challenges that impact their ability to engage in online learning. For example, community organizations can assist with device lending programs, providing students with laptops or tablets for the duration of their studies. They can also offer local support services, such as internet access points or study spaces where students can connect to high-speed internet if they do not have reliable access at home.

By addressing these various aspects of equity and accessibility, conservatories can create a more inclusive digital education model that ensures equal opportunities for all students to thrive in the online learning environment. This approach not only aligns with the values of social justice and equal access but also contributes to the long-term sustainability of digital learning initiatives. When every student has the tools and support they need to succeed, the collective strength of the music education community is enhanced, paving the way for a future where talent and potential can flourish, regardless of socio-economic status or geographic location.

In conclusion, making digital learning equitable and accessible is about more than just providing the necessary technology—it is about creating an educational ecosystem that values diversity, inclusion, and community support. By investing in scholarships, assistive technologies, and culturally responsive teaching, conservatories can ensure that every student has the opportunity to reach their full potential, both in digital and in-person settings. This commitment to equity will help to ensure that the benefits of digital innovation are shared by all, contributing to a more just and inclusive future for music education.

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## Fostering Reflective and Autonomous Learning

One of the most valued features of digital learning, as highlighted in the survey analysis, is the ability to record and review lesson content, a capability that is often unavailable in traditional in-person music instruction. This feature has proven to be a powerful tool for self-reflection, enabling students to take greater ownership of their learning process. By having access to recorded lessons, practice sessions, and performance critiques, students can revisit challenging concepts, listen critically to their playing or singing, and analyse their technique and interpretation in a way that is not possible in a live classroom setting. This ability to engage in self-directed review empowers students to identify areas of improvement on their own and to actively engage with their learning outside of scheduled class times.

For example, a student working on a complex classical piece can record their practice sessions and then listen back to identify intonation issues, rhythmic inconsistencies, or dynamic variations that need further attention. They can then focus on these aspects in their subsequent practice sessions, using the recordings as a benchmark for their progress. This approach transforms the learning process into a continuous cycle of improvement, where students are constantly setting goals, evaluating their progress, and making adjustments. It encourages them to adopt a growth mindset, seeing mistakes not as failures but as opportunities for development and refinement.

To further capitalize on this potential for autonomous learning, conservatories could consider developing digital portfolios for their students. These portfolios would serve as personalized learning records, allowing students to compile their recorded performances, practice logs, and

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instructor feedback in one centralized space. The creation of such portfolios would enable students to track their progress over time, offering a visual and auditory record of their development as musicians. This can be particularly motivating, as students can see and hear how far they have come from their initial attempts to their more polished performances.

In addition to being a motivational tool, digital portfolios have practical applications as well. They can be used to showcase achievements to potential employers, conservatory admissions committees, or collaborators. For instance, a student applying for an advanced performance program or a professional orchestra could present their digital portfolio, highlighting excerpts of key performances, successful interpretations of complex pieces, and positive feedback from instructors. This can give them a competitive edge by providing concrete evidence of their skills and progress. Portfolios can also serve as a networking tool, allowing students to share their work with a broader audience, including mentors and peers who can provide additional insights and opportunities for collaboration.

Another way to enhance engagement and motivation in digital learning environments is through the use of gamification elements. Gamification refers to the incorporation of game-like features, such as interactive quizzes, progress tracking, and performance challenges, into educational platforms. These elements can transform the learning experience into a more dynamic and enjoyable process, making it easier for students to stay motivated and focused during their studies. For example, students could participate in weekly challenges where they submit recordings of their progress on a specific piece, receiving virtual badges or points for their efforts. This type of positive



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reinforcement can create a sense of achievement and progress, encouraging students to push their boundaries and experiment with new techniques.

Gamification can be particularly effective in theoretical subjects like music theory and history, where it can help students to retain complex information and apply their knowledge in innovative ways. For example, a digital music theory course could include interactive quizzes that challenge students to identify intervals, analyse chord progressions, or transpose melodies. Each correct answer could earn points, and students could track their scores over time, giving them a clear picture of their strengths and areas for improvement. This approach makes learning theory more engaging and less intimidating, turning abstract concepts into practical challenges that students can enjoy mastering.

Moreover, gamification can extend to virtual ensemble work, where students can collaborate on digital projects and participate in simulated performance settings. For example, an online platform could include a feature where students record their part of a quartet or trio, and then the system combines the recordings to create a virtual performance. Students could then receive feedback not only from their instructors but also from peer reviews, helping them to understand how their individual contributions fit into the larger musical context. This not only enhances technical skills but also teaches students valuable lessons about musical collaboration and ensemble dynamics, which are essential for professional musicianship.

Beyond these features, fostering autonomous learning through digital tools encourages students to become active participants in their own education, rather than passive recipients of information. By engaging with self-paced learning modules, digital practice aids, and interactive tutorials, students

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develop the ability to self-assess and set their own learning goals. This prepares them for the realities of a professional music career, where continuous learning and self-directed practice are key to maintaining and enhancing one's skills. It also aligns with the broader goals of lifelong learning, ensuring that students are equipped with the skills and mindset needed to adapt to new technologies and musical trends as they emerge.

In this way, conservatories can use digital tools to foster a learning environment that not only emphasizes technical proficiency but also nurtures curiosity, creativity, and self-discipline. Students who are empowered to take charge of their own development are more likely to become innovative thinkers and resilient performers, capable of navigating the ever-changing landscape of the music profession. This approach to learning ensures that they are not only prepared for today's challenges but are also future-ready, equipped to adapt to new methods of music-making, emerging genres, and technological advancements.

### Embracing Innovation for a New Era of Learning

By embracing these innovative approaches, such as digital portfolios and gamification, conservatories can create a more interactive and engaging learning experience that caters to the needs of modern students. This shift represents a move away from a one-size-fits-all model of education, towards a more personalized, student-centred approach that acknowledges the diverse ways in which students learn and grow. It also aligns with the broader educational trends towards blended learning and digital integration, where the goal is to leverage technology in ways that enhance traditional teaching rather than replace it.



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Ultimately, the goal of fostering reflective and autonomous learning is to prepare students to become independent, self-motivated musicians who are capable of charting their own path in the music world. As digital tools become more sophisticated and accessible, they offer unprecedented opportunities to redefine the learning process, making it more flexible, adaptive, and student-driven. By building on these opportunities, conservatories can ensure that their students are not only technically skilled but also empowered thinkers who are ready to embrace the future of music with confidence and creativity.

#### The Role of Digital Tools in Building a Resilient Future

The rapid shift to **distance learning** during recent global challenges has underscored the vital importance of **resilience and adaptability** in the educational sphere, particularly in fields like music, which traditionally rely on **in-person instruction and interaction**. The **experiences and lessons** gathered during this period of adjustment have illuminated the need for music conservatories to **embed these qualities** into their **teaching models** and **curricula**, ensuring that they are **prepared for future disruptions**. Digital tools have emerged as **critical enablers** in this process, offering solutions that allow **continuity in education** even when **physical classrooms** are no longer accessible. As we look towards the future, it is clear that **digital readiness** will remain a cornerstone of **effective music education**, allowing institutions to **adapt swiftly to global events, environmental challenges, or evolving student needs**.

Building a **resilient framework** for music education means **integrating digital tools** into the core structure of conservatories, creating **flexible learning pathways** that can **seamlessly transition**

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between **in-person**, **blended**, and **fully online modes**. This requires developing **digitally-supported curricula** that leverage the strengths of online platforms while maintaining the **rigor and depth** of traditional training. For instance, conservatories could design **hybrid courses** where **theoretical subjects**—such as **music history, theory, and composition**—are taught online, while **performance-based subjects** retain an **in-person focus**. This flexibility ensures that students continue to receive a **comprehensive education**, even in situations where **in-person gatherings** are not feasible.

Moreover, a **digitally-enhanced curriculum** allows for the creation of **modular learning units** that can be **accessed and completed independently**, providing students with the ability to **manage their learning** according to their **personal schedules** and **individual needs**. This adaptability is particularly valuable during **unexpected disruptions**—such as **natural disasters, health crises, or institutional changes**—where students might be temporarily unable to attend **in-person classes**. By offering a robust library of **online resources**, including **recorded lectures, interactive tutorials, and digital practice tools**, conservatories can ensure that students remain **engaged with their studies**, regardless of the **external circumstances**. This approach to **curriculum design** fosters a sense of **continuity and stability**, enabling students to progress in their training even during challenging times.

Beyond adapting to **short-term disruptions**, the integration of **cutting-edge technologies** offers a pathway for **reimagining the learning experience** and positioning conservatories at the **forefront of educational innovation**. Emerging technologies such as **virtual reality (VR), augmented reality (AR), and artificial intelligence (AI)** present exciting opportunities to **enhance traditional methods** of music instruction and provide students with **immersive, interactive learning environments** that

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were previously unimaginable. These tools can transform the **way students practice, perform, and receive feedback**, making the learning process **more engaging, personalized, and effective**.

For example, **virtual reality (VR)** can be used to create **virtual performance spaces**, allowing students to **rehearse in realistic concert hall environments** from the comfort of their homes. These **simulated environments** can mimic the **acoustics and atmosphere** of famous venues, giving students a sense of performing in **prestigious spaces** without the need for travel. Such experiences can help students **build confidence** and **familiarity** with different performance settings, preparing them for **real-world stages**. VR can also be used for **interactive lessons**, where students can participate in **virtual masterclasses** with instructors from around the world, **collaborate with peers** in **virtual ensembles**, or explore **3D representations** of musical instruments and their inner workings. This immersive approach to learning can make complex concepts **more tangible** and **easier to grasp**, enhancing students' **understanding and retention**.

**Augmented reality (AR)** offers another dimension of **interactive learning**, allowing students to **overlay digital information** onto their physical environment. For instance, AR could be used to **visualize musical scores** in real-time, providing **dynamic notations and annotations** as students play, or to **highlight proper finger placements** and **posture adjustments** during practice. This technology can provide **instant feedback**, helping students to **correct mistakes** as they occur, and to **understand technical concepts** through **visual cues**. AR can also be used in **collaborative settings**, enabling students to **see the movements** and **notations** of their peers during virtual ensemble practices, thereby **enhancing coordination** and **communication** in a remote setting.

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**Artificial intelligence (AI)** has the potential to revolutionize **personalized learning** by providing **instant feedback** on **performance accuracy, intonation, timing, and technique**. AI-powered software can analyse **recorded performances** and generate **detailed feedback** for students, highlighting areas for improvement and suggesting **practice strategies** tailored to their specific needs. This type of **real-time analysis** can complement the feedback provided by human instructors, giving students a **comprehensive understanding** of their strengths and weaknesses. For example, an AI tool could help a student identify **subtle rhythmic inconsistencies** in a complex piece or suggest ways to improve **phrasing and articulation** based on data from **multiple performances**.

AI can also be used to create **adaptive learning platforms** that adjust the **difficulty level** of exercises based on a student's **progress and performance history**. Such platforms can provide **customized practice routines**, ensuring that students are always **challenged** at the right level and encouraged to **reach their full potential**. This **data-driven approach** allows for a more **efficient learning process**, where students can focus on areas that need the most improvement and **accelerate their development** in a **targeted manner**. By integrating AI into the daily practice of students, conservatories can ensure that their training remains **rigorous and effective**, even as the **tools and methods evolve**.

The exploration of these **advanced technologies** positions conservatories not just as **adapters** to the digital age, but as **leaders in shaping the future** of music education. By embracing these innovations, institutions can offer their students a **unique, forward-looking approach** to training, one that combines the **depth and discipline** of classical music education with the **dynamic possibilities** of digital tools. This approach allows students to develop a **broader skill set** that

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includes **digital literacy**, **technological fluency**, and the **creative use of new media** in their artistic practice. Such skills are increasingly essential in a music industry that is **rapidly evolving** and where **digital platforms and technologies** play an ever-greater role in **performance**, **production**, and **audience engagement**.

#### Preparing for the Future of Music Education

Building a **digitally resilient future** for music education also involves **rethinking the role** of conservatories in a **globalized world**. With the ability to connect with students and educators from **different countries and cultures**, conservatories can expand their **reach and influence**, offering **cross-border learning opportunities** and **collaborative projects** that were once difficult to achieve. This approach not only **enhances the learning experience** for students but also allows conservatories to **contribute to the global dialogue** on the future of arts education, sharing **best practices** and **innovative methods** with institutions around the world.

By **leveraging digital tools** to build **flexible, adaptive curricula** and by exploring the potential of **VR, AR, and AI**, conservatories can ensure that they remain **at the forefront of educational excellence**, ready to meet the **challenges of tomorrow** while providing students with the **highest standard of training**. This vision for the future is one where conservatories are not merely **reacting to change** but are **driving it**, shaping a new era of music education that is **accessible, inclusive, and innovative**. As the world continues to change, the **commitment to resilience, adaptability, and technological advancement** will be key to ensuring that music education can **thrive in any environment** and continue to **inspire the next generation of musicians**.



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## Conclusion

The reflections and perspectives outlined here provide a vision for the future of digital learning in music education, one that combines the **strengths of traditional teaching methods** with the **potential of new technologies**. By addressing the challenges and building on the opportunities identified in the survey, conservatories can create an educational environment that is **inclusive, adaptable, and forward-thinking**. As the landscape of music education continues to evolve, these strategies will ensure that conservatories remain **vibrant centres of artistic excellence**, capable of preparing students for success in a world where **digital proficiency** and **musical artistry** go hand in hand.



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## Concise Bibliography

### [a] Project Outputs: Erasmus+ KA2 Virtual Stage

#### Giunti Psychometrics, Florence (Italy)

*Virtual Stage: Digital Training Innovations for Performing Arts in Music Education.*

Giunti Psychometrics served as the applicant, with Ensemble San Felice, Florence, acting as the scientific coordinator. This project focuses on the development and implementation of innovative digital training methods tailored for music education, leveraging virtual tools and online collaboration for enhanced training experiences.

#### Ensemble San Felice, Florence (Italy)

*Innovative Approaches to Blended Learning in Music Education: A Case Study from the Virtual Stage Project.*

This output examines the integration of blended learning techniques into the training of musicians, with a focus on developing digital competencies alongside traditional performance skills. The study highlights the impact of virtual collaboration platforms in maintaining continuity in music training during periods of limited in-person interaction.

#### Silesian Theater Opava, Ostrava (Czech Republic)

*Adapting Music Performance Training to Digital Formats: Lessons from the Virtual Stage Initiative.*



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This research explores the adaptation of traditional music performance practices into digital formats, focusing on the unique challenges and opportunities presented by online platforms. It includes insights into the use of digital tools for rehearsals and virtual stage performances.

ESME Sudria Lyon & Tisseurs de Sons Lyon (France)

*Collaborative Online Learning in Music Education: Insights from the Virtual Stage Project.*

The output from these French partners provides an analysis of collaborative learning approaches facilitated through digital platforms, emphasizing the role of interactive technologies in supporting peer-to-peer learning and digital music production.

Heliosfero, Den Haag (Netherlands)

*Implementing Virtual Performance Spaces: A Technical Guide for Music Educators.*

This guide focuses on the technical aspects of creating virtual performance spaces, offering best practices for music educators in setting up digital environments for real-time collaborations and performances. It is aimed at helping conservatories implement virtual solutions for ensemble work and solo performances.

**[b] Anderson, T., & Elloumi, F. (2004).** Theory and Practice of Online Learning. Athabasca University Press.

This book provides a comprehensive overview of theories and practices in online learning, with a focus on creating effective learning environments. It is useful for understanding the foundations of distance education and learning models that can be adapted to music education.



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**[c] Bozkurt, A., et al. (2020).** "A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis." *Asian Journal of Distance Education*, 15(1): 1-126.

This article offers a global analysis of the impact of the pandemic on education, including the necessary shifts to distance learning. It provides context for understanding the challenges faced by conservatories during the pandemic.

**[d] Duffy, P., & Jonassen, D. H. (1992).** "Constructivism: New implications for instructional technology?" *Educational Technology*, 31(5): 7-11.

Discusses the implications of constructivism for educational technologies, highlighting how digital tools can support interactive and participatory learning, applicable to music training.

**[e] King, A. J. (2019).** "The Role of Technology in Teaching Music: Trends, Tools, and Tips." *International Journal of Music Education*, 37(4): 595-605.

This paper examines the use of digital technologies in music teaching, focusing on recent trends, tools, and strategies for effectively integrating digital resources in music education.

**[f] Riley, P., & Park, S. (2014).** "Music Education for the 21st Century: Innovations in Distance Learning." *Journal of Music Technology and Education*, 7(2): 101-116.

Explores innovations in music education through distance learning, with case studies on online music courses and the use of collaborative digital tools.

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**[g] Salavuo, M. (2008).** "Social media as an opportunity for pedagogical change in music education." *Journal of Music, Technology & Education*, 1(2-3): 121-136.

Analyzes how digital media and social networking platforms can support new modes of music learning, facilitating collaboration and sharing of musical content.

**[h] Schroeder, R., & McArdle, K. (2021).** "Teaching Music Online: Adapting Pedagogy for Distance Learning." *Journal of Music Education Research*, 19(3): 317-330.

Focuses on adapting traditional music teaching methods for the online environment, offering insights into effective strategies for maintaining student engagement and instructional quality in remote settings.

**[i] Waldron, J. (2013).** "User-generated content, YouTube, and participatory culture on the Web: Music learning through informal, online environments." *International Journal of Music Education*, 31(1): 91-105.

Investigates the role of online platforms like YouTube in informal music learning, offering perspectives on how participatory digital culture can complement formal music education.

**[j] Webster, P. R. (2018).** "Computer-based technology and music teaching and learning: 2018 update." *Oxford Handbook of Music Education*. Oxford University Press.

This chapter reviews the role of computer-based technology in music education, providing an updated perspective on how digital tools are transforming the teaching and learning process in music schools and conservatories.

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**[k] Zhukov, K. (2020).** "Teaching music performance online: Challenges and solutions." Music Education Research, 22(3): 333-345.

Discusses the specific challenges of teaching music performance online, such as issues with latency and sound quality, and offers practical solutions to enhance the online learning experience for performance students.



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