National Association *for* Music Education

Guiding Principles,
Frameworks,
and Applications
for AI in Music Education
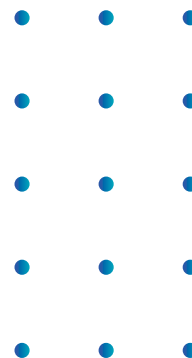
Disclaimer

This NAfME document was developed by an experienced team of authors in the spring of 2025 to support NAfME members in understanding overall principles and trends related to AI and music education, a complex, fast-developing topic. It does not constitute legal advice. Readers are responsible for independently verifying any applicable federal, state, and local laws and ensuring their own compliance with applicable laws and, if applicable, the policies of the school where they teach. This document includes links to websites operated by, and information on publications authored by, third parties; NAfME does not make any representation or warranty regarding the accuracy of such websites or publications and provides such links and information only as a convenience and resource to readers. This document also provides various examples of different kinds of products or services in the field at a particular point in time to support members in understanding general trends and principles related to AI and music education; this in no way implies an endorsement of or recommendation by NAfME of any product or service. NAfME disclaims any responsibility for any specific results related to the use of this report, for any errors or omissions contained in the report, and for any liability, loss, or damage of any kind arising out of the use of this report.

Artifical Intelligence and the Future of Music Education

Nearly every day there is a new headline sharing positive attributes and potential risks associated with Artificial Intelligence. Regardless of how we may feel about technology changing society, the reality is that AI, specifically Generative AI, is here to stay and is impacting music classrooms across the country. Many possibilities exist for GenAI to enhance creativity and instructional practice, and music educators must ensure that such tools are used responsibly. NAfME is committed to exploring the benefits and appropriate use of GenAI in music education. Watch for more information and resources in the months to come.

— Scott R. Sheehan, *Teaching Music*, **April 2024**

The quote above was written in 2024 for a feature article about AI in *Teaching Music* magazine. The article served as a precursor to the formation of a task force that NAfME assembled to tackle the myriad implications that AI presents for music educators. After many months of deep thought, investigation, research, exploration, and inquiry, NAfME's AI Task Force developed a practical resource to guide music educators in navigating the rapidly changing world of AI. We recognize that, by its very nature, AI advances and changes exponentially fast, and by the time these guiding principles are published there will be new technologies that may have replaced some of the ideas and suggestions in this publication. However, what will not change is the need for music educators to stay current and meet their students in the multitude of ways they engage with music. It is our hope that readers will take the opportunity to explore something new, to find creative ways to spice up old lessons, to use AI to become more efficient and possibly more effective, and to not only enhance the craft of music teaching but also teach students how to ethically and responsibly navigate the world we live in today.

NAfME is very excited to share this resource with its members and would like to thank the members of the AI Task Force for their hours of collaboration and for sharing their expertise. Each person brought a unique perspective on how music education can benefit from embracing AI. The potential for ingenuity and possibility that lies ahead is limitless, and we look forward to seeing how musical creativity, performance, responsiveness, and connection continue to grow in the years to come.

Scott R. Sheehan, NAfME Immediate Past President and AI Task Force Chair
Director of Bands and Music Department Chairperson, Hollidaysburg Area Senior High School, Hollidaysburg, Pennsylvania

A Message from NAfME President Deb Confredo

The AI Task Force is a group of knowledgeable and dedicated colleagues who are committed to helping all NAfME members understand the impact of Artificial Intelligence (AI) and how it can be harnessed as a useful professional tool. This document is a user-friendly compendium for music educators and, like all our other tools, should be at the ready for quick and easy access. Inside, you will

- Learn what AI is and how these models can best assist music teachers and learners.
- Have the opportunity to consider the ethics of AI in music education as it pertains to issues that you may already be thinking about (e.g., privacy, deception, and rights to intellectual property).
- Be encouraged to learn about the power and functions of AI as it applies to music, and be challenged to reflect upon these capabilities, engage in introspection on your own level of comfort, and consider your own skepticism and excitement about the incorporation of AI into your work.
- Be given direction in how AI can support rather than supplant music learning through its capacity to enhance and assist in creativity.
- See how AI can be tapped to facilitate greater accessibility in music learning for all children when access to the needed technology is provided.
- Read about effective practices and methods for implementation for music creation, performance, responses, assessment, and productivity.
- Learn about possibilities and potential, while caveats are shared. Put another way, as with any new technology, its use toward good in our profession should always be enacted intentionally and mindfully.

Guiding Principles, Frameworks, and Applications for AI in Music Education is filled with invaluable information, ideas, and details that can help every music educator make informed decisions about the use of AI. The text is robust, and the supporting references are timely and exemplary. We hope that you will benefit from this great work provided for you by the NAfME AI Task Force.

Deb Confredo, NAfME President
Professor Emeritus of Music Education, Temple University, Philadelphia, Pennsylvania

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Prelude

The advent of generative artificial intelligence and the expectation of increasingly powerful artificial general intelligence present the likelihood of significant changes to every sector of human society, including the field of music education. Inside the classroom, these changes will include new music learning activities, greater individualization of instruction, new means of assessment, and the customization of musical materials. AI tools will provide opportunities to save teachers' time as well as increase teachers' abilities and efficacy.

Beyond the music classroom, AI may bring significant changes to the structure of schools, both in the way we educate students and to overall aims and purposes of education. Similarly, the field of music may be transformed, as AI composers significantly reduce the time, money, and expertise needed to create music, resulting in the possibility of a vast expansion of music that is written specifically for a single person at a specific moment. At the same time, it is possible that, as our world mixes human and artificial intelligence, there may be a dramatic increase in demand for shared human-only experiences, such as shared musical performances.

In the midst of these changes, it will be important for music educators to clarify their aims and goals for musical learning and their students' musical cognition. Using these as anchor points, it is important for music educators to thoughtfully explore and consider if and when to utilize AI in their classrooms. This resource is designed to provide a framework to guide music educators' considerations of the ethical applications of AI in the Creating, Performing, and Responding modes of musical engagement, as well as in assessment and non-musical tasks.

"AI is transforming music education, offering new ways for students, educators, and musicians to engage with composition, production, and analysis."

These considerations should include what modality of learning that each music educator is willing to turn over to an AI and what is important to reserve for themselves. Although the Connecting standard is not formally addressed in this document, it is embedded, in part, in the discussion of AI's applications to the other standards.

The NAfME AI Task Force believes that, through reflective and thoughtful consideration, music educators will be able to ensure that AI is used in service of musical learning and to maximize the opportunities for musical instruction. We hope this framework is a useful tool toward these ends.
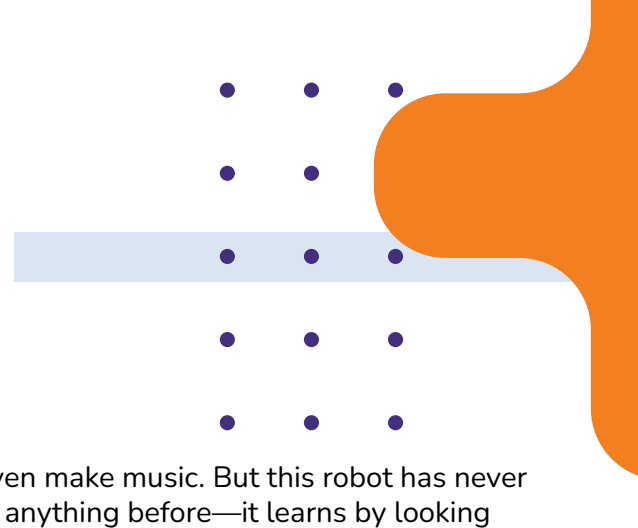
Introduction

Artificial intelligence (AI) is an umbrella term used to classify machines or computer programs that can mimic human intelligence or cognitive functions, like learning, solving problems, or making decisions. AI systems can analyze input, process large amounts of information (data), identify patterns, use those patterns to make predictions or generate new content, and further adapt outputs based on inputs. This is a disruptive innovation that will have a broad impact on society, culture, education, politics, and the economy. Because AI models are changing the way we work, learn, and interact, it is important to understand how they work and what they can do before we discuss their impact on music education.

One type of AI is a large language model (LLM). LLMs are deep learning algorithm programs trained on massive amounts of text data (e.g., books, articles, websites). They have billions of parameters to understand, summarize, generate, translate, and predict new content. They learn how language works by looking at patterns in how words and sentences are used. With this knowledge, they can do things like answer questions, write stories or essays, translate languages, or summarize information.

Generative artificial intelligence (genAI) refers to deep learning models that can not only analyze raw data but also generate novel or statistically probable outputs when prompted. For example, a genAI model can write music, draw pictures, or make videos. It does this by learning from real examples and then creating something new that fits what it learned.

One popular type of genAI is generative pre-trained transformers (GPTs). These are language prediction models based on transformer neural networks, which learn context and meaning from sequential data (e.g., text, audio, video, images), then use that knowledge to generate new data.

Inspired by a ChatGPT response, imagine you have a smart robot friend who loves to draw pictures, tell stories, or even make music. But this robot has never experienced anything before—it learns by looking at lots of pictures, listening to millions of songs, or reading libraries' worth of books. Now, when you ask the robot to draw a cat, it does not copy a picture of a cat—it remembers all the cats it has seen and makes a brand-new cat just by mixing and matching little bits of what it learned to create something new. GenAI models study a huge amount of information, learn patterns, and then make something new based on their prompt.

General Uses of AI Models

AI is transforming both business and education by streamlining operations, enhancing decision-making, and personalizing user experiences. In business, AI-powered customer support systems and chatbots are improving response times with mixed results for customer satisfaction. Marketing teams leverage AI to analyze consumer behavior, optimize ad targeting, and generate personalized content. Data analytics and business intelligence tools help organizations make data-driven decisions, while automation reduces repetitive tasks, cutting costs and increasing efficiency. AI also plays a crucial role in fraud detection, cybersecurity, and supply chain management by predicting risks and optimizing logistics.

Current readily available AI models, which are in different states of development and/or adoption, have various clerical and creative uses, including but not limited to the categories below:

- AI Detection: identifying AI-generated content
- Image Generation: creating visual content from a text prompt
- Video Generation: creating video content from a text prompt
- Text Generation: creating new text content from a text prompt

- Smart Devices: home electronics using AI processing either locally or via the internet
- Task Support: AI tools to automate and optimize tasks
- Customer Support and Chatbots: AI-powered virtual assistants
- Data Analytics: extracting insights and predictive analytics
- Cybersecurity: fraud protection by detecting anomalies

Musical Uses of AI Models

AI is transforming music education, offering new ways for students, educators, and musicians to engage with composition, production, and analysis. AI models can analyze vast amounts of music to uncover patterns, trends, and structures across genres, providing valuable insights for learners. These tools can help students understand music theory more intuitively by visualizing chord progressions, melodies, and harmonic relationships nearly in real time. Additionally, AI-powered platforms enable hands-on experimentation, allowing learners to generate compositions and explore various musical styles with minimal technical barriers. However, these advancements also raise important questions about the role of AI in music education, the balance between human creativity and machine assistance, and the ethical implications of using AI-generated music.

AI-driven tools are enhancing musical creativity and learning by serving as virtual collaborators in composition and arrangement. In educational settings, AI could potentially assist students by generating melody suggestions, harmonizing pieces, and even providing personalized exercises to improve composition skills. These technologies can democratize music-making, making it more accessible to students of all backgrounds and skill levels. However, while AI can support creativity,

it also sparks discussions about authorship and artistic expression. As AI-generated music becomes more sophisticated, educators and musicians must consider its impact on originality and the traditional creative process. Understanding how musicians and students perceive AI's role in music-making is crucial to shaping its integration into education in a way that enhances, rather than diminishes, artistic development.

AI music models are changing rapidly. Below are some of the current musical capabilities:

- Source Separation: isolating individual sounds from an audio mix
- Sample Generation: creating new specific audio samples from a text prompt
- Music Generation: text-to-audio music generation
- Effect Plug-ins: AI-powered audio effects
- Instrument Plug-ins: AI-powered digital instruments
- Mastering: automatic audio analysis for mastering
- Voice Synthesis: transform vocals to sound like someone else or speak in a different language

As these AI music models get better, more capabilities will have to be categorized. And honestly, no one knows what AI models will look like by the end of the year, much less in the future. AI models can process and integrate inputs from multiple modalities and become augmented with third-party plugins, creating artistic output that is not currently possible or even imaginable. With that said, the player piano did not replace pianists, the synthesizer did not replace orchestras, and AI will not replace humans, creativity, or emotions. However, AI will change musicians' relationships with time and the creative process.

Questions for Reflection

- What initial ideas and possibilities come to mind after reading the introduction?
- How comfortable are you using AI with your students? What do you want to learn more about?
- Are there areas of AI that give you pause? If so, why?
- What aspects of AI make you excited about teaching music?

Ethical Considerations

AI has significant potential to enhance music education in various ways, including virtual and augmented reality experiences, personalized learning pathways, intelligent tutoring systems, composition aids, enriched historical and contextual learning, advanced assessment tools, interactive ear training and music theory programs, and platforms for music collaboration and performance (Merchán Sánchez-Jara et al., 2024). However, its integration also raises important ethical considerations that educators must address.

Privacy and Data Security

AI-powered tools often collect student performance data to provide feedback and personalize learning experiences. This raises concerns about how data is stored, used, and protected from potential misuse. Schools and educators must comply with data protection laws, such as the Family Educational Rights and Privacy Act (FERPA), to ensure student information remains secure. Teachers should prioritize platforms with clear, transparent privacy policies and choose tools that minimize data collection whenever possible. Additionally, educating students about digital privacy and responsible data sharing is essential. Before adopting AI tools, educators should ask vendors about encryption practices, data retention policies, and access controls to safeguard student data and maintain compliance with privacy regulations.

Learn more: AI and the Law: What Educators Need to Know (Source: Edutopia, 2024)

Bias and Fairness

AI systems are only as unbiased as the data they are trained on, which means they can unintentionally reinforce stereotypes or create inequalities in access to resources and personalized learning. In music education, this may appear in various forms. For example, AI tools might prioritize Western classical music over other musical traditions or provide better recommendations for students whose backgrounds align with the training data. An AI composition tool, for instance, might generate melodies that reflect only certain musical styles, limiting students' exposure to diverse genres. To ensure inclusivity, educators should critically assess AI tools for potential bias and supplement AI-generated recommendations with music examples from a wide range of cultures and traditions, fostering a more equitable learning environment.

Learn more: Thinking About Equity and Bias in AI (Source: Edutopia, 2024)

Transparency

Educators and students need to understand how AI tools work, including their limitations and decision-making processes, to use them effectively and with confidence. Many AI tools function as "black boxes," providing recommendations or assessments without explaining their methodology, which can undermine trust and learning. For instance, if an AI system marks a student's rhythm performance as incorrect, both the teacher and student should know the criteria used for evaluation. Teachers should prioritize AI tools that offer transparent explanations and help students develop critical thinking skills to assess AI-generated feedback. By fostering an understanding of how AI makes decisions, educators can empower students to engage more thoughtfully with technology in their learning.

Learn more: What is AI Transparency? A Comprehensive Guide (Source: Zendesk, 2024)

Cheating

One of the biggest concerns for teachers is ensuring that students submit original work rather than assignments, such as essays or musical compositions, generated entirely by AI. To address this, clear guidelines on AI use and documentation should be established. While specific policies may vary by teacher or school, some general best practices include using AI as a tool for brainstorming, outlining, drafting, revising, and reflecting—while ensuring that the final work represents the student's own ideas and voice. Assignments should be scaffolded, allowing teachers to provide feedback at key stages. Additionally, students should learn how to properly cite and attribute AI-generated content through citations, footnotes, or reflective process statements. Through these strategies, educators can help students engage with AI ethically while maintaining academic integrity.

Learn more: [Teaching with AI: A Practical Guide to a New Era of Human Learning](#), especially Ch. 6, Cheating and Detection (Bowen & Watson, 2024)

Teacher Roles

AI should be used as a tool to enhance, not replace, educators' ability to inspire a love of music in students. While AI can assist with certain tasks, it cannot replicate the essential human aspects of music teaching, such as social-emotional support, mentorship, and fostering musical expressivity. Educators should integrate AI in ways that complement their instruction, without becoming overly dependent on it. For example, AI can assist with grading and tracking students' progress. However, educators should not rely solely on AI for evaluation. Instead, they should combine it with their own professional judgment and insights into students' musical growth. By using AI strategically, teachers can enhance their effectiveness while preserving their role as the primary source of musical instruction and inspiration.

Learn more: [Practical AI for Instructors and Students (5-part video series)](#) (Wharton School, 2024)

Intellectual Property

It is essential to respect copyright and clearly define ownership rights for student-created works such as AI-assisted compositions. The U.S. Copyright Office (2025) asserts that current copyright laws are adaptable enough to encompass emerging technologies, just as they have for past technological advancements. It states that generative AI outputs may qualify for copyright protection only when a human author contributes meaningful creative expression. This includes cases where a human's original work is evident in the AI-generated content or when a person creatively arranges or modifies the output. However, simply providing prompts to an AI system does not meet the threshold for copyright protection. Teachers should educate students about intellectual property rights and ensure that AI tools used in the classroom respect copyright laws.

Learn more: [Copyright and Artificial Intelligence: U.S. Copyright Office](#)

Dependency and Skill Development

Overreliance on AI tools in music education could hinder students' ability to develop fundamental musical skills. While AI can support and enhance music learning, it should be integrated thoughtfully to ensure students continue building fundamental abilities such as aural skills, music reading skills, and instrumental or vocal technique. Music educators should intentionally balance AI-assisted and traditional learning approaches, using AI as scaffolding (McLeod, 2024) that can be gradually removed as students develop mastery. For example, some ear training software provides interactive exercises that adapt to a student's skill level, helping them recognize intervals, chords, and rhythms. As students improve, AI reduces hints and increases difficulty. AI should be used to support, not replace, the development of traditional musical knowledge and skills.

Learn more: [The Impact of AI on Children's Development](#) (Source: Harvard Graduate School of Education, 2024)

Creativity and Autonomy

AI tools should support, not control, musical creation, ensuring students have opportunities for independent exploration, creative thinking, and self-expression. Teachers should encourage students to use AI tools for inspiration and experimentation, promoting independent exploration and self-expression. For example, an AI songwriting assistant might suggest melodies, rhythms, or chord progressions—or even generate entire pieces—but the student should ultimately decide how to shape and refine their composition. Teachers can guide students in critically evaluating AI-generated suggestions, helping them make informed creative decisions. Students should view AI as a helpful tool in their creative process, not as the final authority on musical "correctness."

Learn more: [Exploring Applications of Artificial Intelligence in Music Education: A Focus on Creativity and Composition](#) (Guarriello, 2024, in *Music Educators Journal*)

Accessibility and Inclusion

AI has the potential to enhance accessibility in music education, but only if it is designed with inclusivity in mind (Song et al., 2024). For example, AI-driven speech-to-text tools can provide real-time transcription for students with hearing impairments, while text-to-speech technology can assist those with visual impairments or dyslexia by reading content aloud. Additionally, adaptive AI technologies can create alternative learning pathways, tailoring instruction to support neurodiverse students. However, many AI-powered music education tools require high-speed internet, modern devices, or specific physical abilities, posing barriers to access. To bridge this gap, schools must ensure students from under-resourced communities have access to necessary technology. Music educators should also advocate for AI tools based on Universal Design for Learning and inclusive teaching practices to ensure all students can benefit from AI-enhanced learning experiences.

Learn more: [Universal Design for Learning](#) (CAST, 2024)

Questions for Reflection

- What do you think are the most important ethical considerations for AI in music education? In the next 1–2 years? In the next 3+ years?
- Have you talked with your students about using AI in their music classes? What strategies have been most effective for you when discussing these issues with your students?

Applications and Implications: Create

Musical creativity flourishes in the soil of inspiration. Composers and musical artists throughout history have drawn from the styles and techniques of their peers and their predecessors—Bach was influenced by Buxtehude, Mozart was inspired by Handel, and countless others have developed their voices by internalizing the traditions that came before them. Improvising jazz musicians similarly create within established structures, exploring melodies and following chord progressions. In this way, creativity does not emerge from a vacuum but from interaction with preexisting material and "intelligences." Today, generative AI functions as another potential source of inspiration, providing new pathways for musical exploration. In fact, generative AI has been creatin g music since as early as 1957 (Hiller and Isaacson).

Incorporating AI in Creating

AI systems now allow musicians and students to explore a range of compositional and improvisational approaches, from text-based prompts generating new melodies to AI-assisted harmonization and style emulation. These avenues for creation may offer a collaborative opportunity for students to interact with music in novel ways, amplifying efficiency and sparking—rather than supplanting—human creativity. As AI-generated content becomes increasingly sophisticated, music educators must consider how to best frame AI as it intersects with their own creative faculties. We must help students balance technological *assistance* with artistic decision-making, ensuring that AI remains a catalyst for creative growth rather than a crutch for passive music-making.

In recent decades, the availability of powerful consumer music tech apps (e.g., MIDI keyboards, DAWs, notation apps, loops, virtual instruments) have been embraced by many in music education for their ability to bring aspects of music-making into the reach of students without formal music theory training. Some were concerned that use of loops,

samples, etc. would be a shortcut to creativity, leading to uninspired productions and an atrophying of traditional skills. In fact, these music tech advances—along with national standards shifting toward musical creativity—have led to a proliferation of composing, arranging, producing, and recording in existing and new school music classes (and to the increased participation of what music educators sometimes refer to as the "other 80%"—students not in school band, chorus, or orchestra). As an example, loops offer students a measure or two of pre-made musical content (e.g., a short drum, guitar, bass, or keyboard groove), but selecting various loops that complement one another rhythmically and tharmonically, setting the tempo, changing the texture (number of concurrent loops), designing the form (how the music unfolds over time), and many other factors are important musical decisions students make that determine the interest of the music they produce. Teachers integrating these tools into music assignments find that using new tech tools musically, imaginatively, and diligently leads to compelling student works, whereas these same tools used mechanically, and without thought or effort, leads to unremarkable, less compelling creations.

> **"AI has the potential to make music creation more accessible to a wider range of students, particularly those who may not have traditional musical training."**

The use of generative AI tools offers the same sort of opportunities and pitfalls for music teachers and their students. For example, student songwriters may use AI to brainstorm ideas for song lyrics. Students who rework, refine, massage, and craft these proto-lyrics into expressive language of their own will likely end up with lyrics that resonate with themselves and listeners. Students who don't will end up with lyrics that sound unremarkable, at best, and awkward or silly, at worst.

The more that digital examples are input and aggregated into AI tools for music creation, the better these tools are at creating convincing content. This partially explains why early AI music tools are good at creating convincing popular music but are still rather limited in their ability to mimic classical music of various eras and composers.

The integration of AI into music education raises important questions about the nature of creativity, authenticity, and authorship. If a student generates a piece of music using AI, to what extent can it be considered their original work? AI systems are trained on vast datasets of existing music, meaning that their output is not necessarily new but rather a recombination of prior influences. This raises questions about whether AI-generated compositions challenge traditional notions of originality or if they simply reflect a digital extension of historical creative processes, much like composers have always built upon the work of those before them.

Bias is another key consideration in AI-generated music. AI models are trained on the data provided to them, which means they often reflect the biases inherent in those datasets. If the majority of training data comes from Western classical traditions, the generated output may disproportionately favor certain harmonic conventions and stylistic choices, potentially marginalizing other musical traditions. As music educators explore AI tools in the classroom, they must consider whether these technologies promote inclusivity or if they reinforce existing biases. Encouraging students to question and adapt AI-generated music, rather than accepting it at face value, fosters a critical approach to creativity.

Resources/Research

The intersection of AI and musical creativity is being explored in depth by researchers. Scholars including David Cope and Eduardo Miranda have examined ways in which AI can function as both a collaborator and a generator of new musical material. Margaret Boden's work provides a broader philosophical framework for understanding how AI challenges traditional definitions of creativity. Organizations like AI Music Creativity (AIMC) hold annual conferences

with a goal "to bring together scholars and artists interested in the virtual emulation of musical creativity and its use for music creation, and to provide an interdisciplinary platform to promote, present and discuss their work in scientific and artistic contexts." The *Journal of Creative Music Systems* (*JCMS*) aims "to advance the development of computational creative systems in the domain of music."

A range of AI tools designed to support musical creativity are now available for exploration in educational settings. Platforms allow students to experiment with AI-generated music in accessible formats and offer composition assistance. Notation software, such as Dorico and Sibelius, has begun integrating AI-assisted features, streamlining aspects of composition and orchestration.

Effective Practices

The following are examples of ways to integrate AI tools into creative music-making:

- Use an AI tool to suggest various parameters of a song/composition (e.g., song title, lyrics, form, instrumentation).
- Have students use AI tools to generate a still pictures slideshow or a video that corresponds to a recording of a programmatic composition (based on the idea behind Mussorgsky's *Pictures at an Exhibition*).
- Use an AI composition app to transform a student melody into an arrangement in the style of various composers throughout history (e.g., see https://doodles.google/doodle/celebrating-johann-sebastian-bach/).
- As a class or in groups, study a classic pop/rock tune, listening to various parameters of the music (e.g., key, tempo, instrumentation, style/genre, form, length). Next, input these parameters into an AI song generator. Compare the original hit with the AI imitation, comparing/contrasting each parameter.

To maximize the educational value of AI tools, music educators can incorporate structured assignments that balance AI-generated material with human interpretation. For example, students might use an AI-generated melody or harmonic progression as a starting point, then refine and expand upon it to develop a complete composition. Similarly, students could analyze AI-generated pieces in different styles, comparing them to historical examples and discussing how AI interprets stylistic traits. By framing AI as a tool for exploration rather than an endpoint, educators can encourage students to engage with technology in a way that fosters creativity rather than diminishes it.

Projects in which students interact with AI-generated material—modifying, rearranging, and responding to it—can deepen their understanding of both musical form and expressive decision-making. Through these approaches, AI can be used not only to generate music but also to inspire deeper musical engagement and creative thinking.

Areas for Inclusion and Accessibility

The following are examples of ways to employ AI tools that facilitate musical creativity for diverse learners:

- Use an AI text-to-speech app to "speak" the script of a podcast, the voiceover for a mock radio ad, etc. (i.e., selective mute, speech-impairment, etc.)
- Use an AI music production tool to generate accompaniment tracks at various tempi to use in classroom rhythm clapping, ensemble warmup, jazz improvisation practice, etc.

AI has the potential to make music creation more accessible to a wider range of students, particularly those who may not have traditional musical training. Many AI-based composition tools allow users to create complex musical structures without requiring proficiency in notation or instrumental performance. This opens the door for students who may not have had access to formal music education to explore composition and production in meaningful ways. By reducing technical barriers, AI can potentially empower more students to participate in the creative process.

Responsible Use of Intellectual Property

- Use of an AI application should never be in place of an assigned creative task. For example, if students are asked to compose, write, arrange, produce, or perform music, and, instead, a student turns in music completed by an AI app, there are issues of academic dishonesty and intellectual property.
- If so directed/allowed by a teacher, students may use an AI app to develop certain components of a creative musical work. The use of such a tool should be acknowledged by the student. For instance, students may use an AI app to brainstorm lyrics for a song or rap.

Since AI systems are trained on preexisting compositions, the boundaries between original creation and derivative work become increasingly blurred. Who owns an AI-generated composition—the student who prompted the AI, the developer of the AI software, or the original creators whose music influenced the model? Educators must equip students with an understanding of copyright law and ethical considerations, ensuring they recognize the implications of using AI-generated material in their compositions and performances.

Attribution and transparency are also essential in the responsible use of AI. Just as scholars cite sources in research, musicians should acknowledge when AI has played a role in the creative process. Additionally, AI-generated music raises concerns about plagiarism—if an AI model produces a melody strikingly similar to an existing work, is the student responsible for verifying its originality? By fostering discussions about intellectual property, ownership, and ethical use, educators can help students navigate the complex landscape of AI-generated music responsibly.

Questions for Reflection

- Prior to the rapid emergence of AI, how did you define *creativity*? When talking about creativity today with students, parents, or administrators, would you frame the topic slightly differently based on what you know now about AI?

- What are your most important long-term goals for your students regarding creativity? How can AI help you achieve these goals?

Applications and Implications: Perform

Music educators benefit by being aware of some of the developing AI technologies and trends related to performing music. In some cases, there may be direct applications to their own classrooms. In other cases, an awareness of trends in the field may be relevant to students' future engagement with music as lifelong music makers or in careers in music.

Incorporating AI in Music Performance

AI for music performance is currently limited for consumers due to the real-time nature of live music and the processing power requirements for AI models. Many AI models break down their input into tokens, or fundamental units of data, which they can process based on their algorithms. AI tokenization in genAI can involve separating text into words and punctuation, breaking down images into groups of pixels, or splicing audio into tokenized representations of voices or instruments. AI models then go through the process of embedding these tokens into numerical vectors for processing and prediction based on probability distributions, selecting the most likely AI token sequence, and decoding the output for humans.

Many times, this processing occurs on server farms via the internet, resulting in a latency of several seconds. However, this does not mean AI is not capable of real-time audio processing. Researchers are currently working on new ways to interact with AI models in a live setting. However, these examples mean we may need to rethink what it means to perform with technology. For example, Georgia Tech's Shimon combines robotics and computational music modeling so Shimon's robot arms can perform on the marimba, allowing it to interact with other musicians. You can experiment with Google's AI Duet to understand some of the current imitative capabilities.

AI models have the capability of sound synthesis based on imitative sounds. For instance, Sketch2Sound allows someone to transform their voice or instrument into other instruments, animal sounds, nature sounds, machine sounds, or other human sounds. FMDUM can turn a single voice into Indian music by imitating percussion instruments and Indian vocal excerpts with lyrics. Potentially, this means any person can create music of any style regardless of their music education or skill level.

AI models for live large ensemble performances are not currently available, but someday they will be. Music educators may have to rethink how much of their performances are purely acoustic, acoustic-electric, or purely electronic. The role of AI models can be that of a collaborator or another performer. There are also extramusical examples of possible live AI-powered performances including, but not limited to, automatic sound mixing, feedback suppression, projecting text and translations, score following, live accompaniment, interactive lights or sounds, newly generated lyrics, custom arrangements for ensembles, audience engagement, or auto-generated playlists.

One of the more exciting aspects of AI music performance is the possibility of using a small language model of your own voice or instrument to create new music. Holly Herndon created a model of her voice called Holly+ that allows her to sing in multiple languages and styles of music. Jordan Rudess, keyboardist for Dream Theater, has been working with the MIT Media Lab to create "Symbiotic Virtuosity" as a way to enhance solo performance. At the time of this writing, there is not a commercial app that allows you create your own small language model. But in the future, it's likely you'll be able to build one using your own data and use it as a creative partner to help you grow your musical abilities.

Examples of AI Tools

- Georgia Tech's Shimon:
  https://gtcmt.gatech.edu/shimon

  - A Shimon Performance:
    https://www.youtube.com/watch?v=l9OUbqWHOSk

- Sketch2Sound:
  https://hugofloresgarcia.art/sketch2sound/

- Hance (real-time audio enhancement):
  https://hance.ai/

- FMDUM:
  https://manaswimishra.com/portfolio/fmdum-live-performing-indian-music-through-a-filter-of-foundation-models/

- Holly+:
  https://holly.plus/

- MIT's Symbiotic Virtuosity:
  https://www.media.mit.edu/projects/symbiotic-virtuosity/overview/

- Google's AI Duet:
  https://experiments.withgoogle.com/ai/ai-duet/view/

Questions for Reflection

- Have you had any experience with using AI as a "collaborator" and/or "performer"? If so, was this interaction positive and would you recommend it to other music educators?

- Based on your teaching context and the ensembles you work with, do you anticipate using AI in some way during the next 1–2 years in a performance or to prepare your students for a performance?

- Does AI have a place in an ensemble setting? What are the benefits and what shortcomings might you encounter?

Applications and Implications: Respond

With any planning and instructional task, regardless of musical concept, activity, or setting, music educators regularly ask themselves: What is the effect on student musical experience? What is the effect on student musical learning? While these questions often drive curriculum and teaching, they become even more central when considering how to incorporate AI into curricular planning, preparation, and instruction.

With particular attention to AI and responding, music educators might consider how AI can be used as a way to prompt student responses, critiques, and analysis. For example, students may rely upon AI to generate written responses to teacher questions or prompts. Teachers might wonder how to mitigate students relying on AI to do the responding for them, as well as ways AI might aid in helping students to respond in clearer, more articulate ways.

One way to incorporate AI and responding in holistic, student-generated ways may be through having students take on different musical roles as they respond (Bernard, 2022). Musical roles can include performer, arranger, composer, conductor, critic, producer, choreographer, actor, dancer, director, musicologist, historian, or poet/librettist. Each of these musical roles has specific knowledge and practice associated with them. While some roles may overlap with one another—for example, analyzing a piece of music is a practice shared by performers, arrangers, producers, musicologists, and critics—each role will approach the activity differently. Similarly, a performer might take on the role of musicologist to learn more about the history and background of an aria, noting specific performance practices or ornamentation.

With regard to responding, for example, a performer might respond differently than an arranger to listening to a recording. While both roles might address particular musical concepts and elements, the ways in which they evaluate them may be different. An arranger may think from a more structural standpoint, noting how dynamics or expressivity change as the form progresses, as opposed to, say, a performer, who may think from a more storytelling perspective and consider whether the story told in the recording was compelling, and why or why not. As students take up the knowledge and practices associated with the musical role, they gain "an understanding of how knowledge is produced in the disciplines" (Moje, 2008, p. 97). In turn, they can communicate with the larger community and see themselves as artistic beings who can create, perform, respond, and connect to and with music in hands-on ways. Through this process, students gain independence as they engage in the work that artists do.

In other words, each musical role uses different practices, or discourses, central to that role of being a musician (Bernard & Abramo, 2019; Moje, 2008). Engaging in responding activities through and with AI in specific musical roles may allow students to engage in musical processes in a hands-on way.

Incorporating AI in Responding Activities

Instructional Planning

Music teachers may consider various ways that AI might assist them in planning musical experiences and activities in which their students can respond. For example, to aid with efficient planning, teachers may use AI to generate a list of songs and connections related to a world event or piece of literature or time period. Using that playlist as a basis, teachers may build a unit or lesson and consider how students may respond to the playlist in different musical roles, to make connections. Or they may incorporate

AI generated text and images into their lessons to prompt student analysis, response, and critique as performers, composers, or critics.

Responding Practices in Different Musical Roles

Performer

Part of the role of a performer is receiving and responding to feedback. Music teachers might incorporate an AI program such as PracticeFirst or Sight Reading Factory to analyze student playing or sight-reading during rehearsal, aiding students in their performer role. Students may use the feedback to evaluate and refine their playing; they may note specific passages and isolate them for practice. This may be an individual activity or may be done in small groups, where students reflect together and decide upon what changes they will make as they practice.

Composer/Arranger

Part of the work of a composer/arranger is responding or analyzing. One practice of composers/arrangers is consistently looking for patterns as they create or analyze. Students may take on the role of composer/arranger to look at an existing piece of music (perhaps one they are currently playing or studying). For example, in an elementary or middle school general music class, students may study the blues and blues form. They might look at "Can't Lose What You Ain't Never Had" by Muddy Waters as a class and identify patterns—form, dynamic patterns, instrument patterns, etc. Once they chart these patterns, they may choose 1–3 of them to begin creating their own blues song. Students may choose the topic for their blues song (e.g., a favorite in my elementary class has always been the "I Have to Wake Up Early for School Blues") and then decide which instruments might best be used for their blues song. Since the blues are repetitive, students may decide what changes must occur dynamically on the repeated sections in an AAB form. Using an AI program, such as Riffusion, students may input this information to create a blues song using their chosen patterns. Upon hearing the melody and instrumentation, students will analyze what they

hear and debate if the instruments (in terms of timbre and tone, for instance) and other decided upon patterns (dynamics, phrasing, etc.) match the blues concept. They can refine using more prompts until they are satisfied with their blues composition.

Critic

Students may take on the role of critic to respond to music in a number of ways. They may feed specific musical prompts (e.g., a song for two singers about the high school basketball team at X high school and their winning streak with a Reggaeton beat) to an AI-generated platform such as Riffusion or Udio to create a piece of music. These platforms create full-length songs. Then, as critics, they may discuss what they heard and provide feedback about the piece and how to improve it (e.g., looking at timbre, color, and other style elements in a piece of music). They may then feed more refined prompts or may choose to edit their current song. Students may remix the song or select and replace specific sections of the piece if they do not like what was produced by the AI; they may create a cover version of the song or even extend the song. Based on the outcomes, students may continue the critique process, noting what changes they hear, what they like and why, and how they might continue to improve it.

Similarly, students may become critics as they debate issues of AI in music, drawing from real, recent scenarios (such as the 2023 AI-generated song mimicking Drake and the Weeknd that sparked widespread discussion of copyright concerns and ethical questions). Students can be assigned to a side to debate whether the piece is "legitimate" as a piece of music, even if it was not written or recorded by the artists, and why. To do this, students will need to draw from their musical knowledge to construct arguments. This will allow students to respond in the role of critic while also considering responsible uses of intellectual property, an important component when using AI-generated material.

Further, in a middle or high school setting, teachers might have students ask AI to compare two pieces of music. Perhaps they are working in class on two

versions of the same piece. They might even ask AI to compare the piece to a world event. Then students (a) determine if they agree or disagree with AI's argument, and (b) explain why.

Career Exploration

An extension of understanding musical roles to elicit musical response could include exploration of musical careers. There are myriad careers in music beyond performance, and AI can assist students in learning how their interests and abilities may lead to a rewarding field of work and/or vocation. As AI rapidly develops, this will be an important area in which to monitor trends and implications for current and future possible careers in the field of music and the integration of the arts more broadly.

Reflection Tool

All musicians, regardless of musical role, consistently reflect upon their work. AI programs may aid in the reflection process when used as a tool for students. In the above examples, students took on different musical roles as they reflected as composers/arrangers, performers, and critics. Such reflections may be extended further and be used in multiple musical roles. For example, students may write a prompt to create a short AI music-generated clip that relates to how they feel about their performance of a piece, as a self-reflection or self-assessment. Or they may prompt an AI engine such as DALL-E 3 or Sora to create a visual that encapsulates their thoughts. This process may require finessing from the student until they achieve the most accurate representation of their thoughts or feelings.

Finally, as a class, students might listen to a piece and, while they listen, individually write down adjectives to describe what they hear. These descriptors may then become prompts for students—individually or in pairs—to generate AI visual images (again, perhaps using DALL-E 3 or Sora). Then, in

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small groups, students may compare and contrast their visual prompts using a chart or Venn Diagram. This may allow students to see other student images and discuss how one's thoughts and responses to music may be represented visually. This might extend to examining existing artwork that was inspired by musical compositions, such as Whistler's *Nocturnes* (inspired by Chopin's Nocturne, Op. 9, No. 2), Mondrian's *Broadway Boogie Woogie* (inspired by jazz and, specifically, boogie woogie), Keith Haring's *Untitled* (inspired by dynamic sounds of the streets of New York City and the lively beats of clubs), or Debussy's *La Mer* (said to have been inspired by the painting "The Great Wave Off Kanagawa" by Hokusai). Students may follow a similar compare-and-contrast process, analyzing the visual and the audio and noting overlaps, with the intention of articulating how sound ideas may be represented visually, and vice versa.

Responding to Music as AI Progresses: A Wondering

As AI grows more advanced, we wonder in what ways it may work to close the loop between composer and responder. Currently, when one self-selects a piece of music on a streaming platform, or presses play on a "curated just for you" playlist, they are, in a sense, along for the ride to listen to the song. They may select to bypass the song based on their response to the piece, but it is a conscious and manual decision. But what happens when one can listen to—and respond to—music in live time, where the musical content changes in live time based on the human response?

As technology progresses, one will be able to receive more personalized, created-just-for-you content using AI, including compositions or arrangements tailored to one's sonic or stylistic interests. Will AI be able to sense how one responds to this personally created music and adjust the music in live time based

on the particular response, such as by detecting a lower heart rate in the listener and responding with a relaxed bass line in a song, or by prompting more energy with an accelerando and moving toward a faster beat per minute? How might music educators incorporate this in their teaching? In what ways might such advancements foster a greater sense of musical community within the classroom? In what ways might it cause dissonance?

Regardless of musical role, responding to and analyzing music will always be at the heart of the work musicians do. Considering ways to expand this work using technology, and specifically AI, is an important practice that music educators must begin to adopt in order to continue to provide hands-on, real-world musical opportunities for students.

Questions for Reflection

- In the age of AI, what does a holistic approach to *responding* to music mean to you? What might it mean to your students? Consider asking them!

- At the end of your next academic year, what would you want your students to know, remember, feel, and be able to do in regard to the various intersections of AI, technology, and responding to music?

Applications and Implications: Assessment

If you've ever felt overwhelmed by the amount of assessment that comes with teaching music— whether it's grading performance exams, theory assignments, or listening reflections—you're not alone. For most music educators, finding time to give meaningful feedback to *every* student can feel impossible, especially when you're teaching large ensembles or multiple classes.

AI tools can streamline your assessment process, give students instant feedback, and help you gather meaningful data about their progress. While it is not a replacement for the human connection and musical expertise you bring to your teaching, when used thoughtfully, AI can help you spend less time on busywork and more time focusing on the artistry and creativity that matter most.

What AI Can (and Can't) Do for Music Assessment

AI is great for handling the technical side of music assessment:

- Checking pitch and rhythmic accuracy
- Evaluating tempo consistency
- Providing instant feedback on performance
- Grading theory and ear training exercises
- Analyzing compositions for harmony, counterpoint, and notation accuracy

But AI has its limits. It really can't judge musicality, expression, interpretation, or stage presence the way a teacher can. It's up to you to combine AI-driven assessments with your own feedback to give students a complete picture of their musical growth.

AI Tools That Can Help You Right Now

Here's a roundup of some AI-powered tools you can bring into your classroom or ensemble. Many are easy to use and offer free or affordable versions to get you started. While many of the software titles associated with the categories below do not currently employ AI algorithms to assess student work, some do. This will likely change over the next few years, as companies further integrate AI tools to remain relevant and competitive.

Performance Assessment Software

- **What they do:** Offers an extensive repertoire library with assessment features that give students real-time feedback on pitch, rhythm, and tempo.
- **Why they're helpful:** You can assign individualized practice, track student progress, and provide feedback even when you can't listen to everyone live.
- **Tip:** Use the software's analytics to spot trends in your ensemble—who's struggling with rhythm? Who's improving their intonation?

Sight Reading Software

- **What they do:** Generates sight-reading exercises tailored to your students' abilities, and many platforms now include AI-powered performance assessments.
- **Why they're helpful:** Easy differentiation! Your beginners and advanced students can work at their own levels without extra prep from you.
- **Tip:** Use these tools for low-pressure, weekly sight-reading check-ins. It builds consistency and reduces performance anxiety.

> "When used thoughtfully, AI can help you spend less time on busywork and more time focusing on the artistry and creativity that matter most."

Ear Training Software

- **What they do:** Adaptive ear training and music theory software that adjusts to student responses, offering practice and assessments that fit individual learning levels.
- **Why they're helpful:** Students get immediate feedback, and you get clear data on their progress. It's ideal for flipped learning or self-paced theory work.
- **Tip:** Have students set personal goals based on their assessment scores: "I want to get 80% on chord progressions by next month."

Practical Ideas for AI-Powered Assessment

Here are five easy ways to start integrating AI into your assessment routines without overhauling your entire teaching approach.

1. Instant Performance Feedback. Record student performances (e.g., scales, etudes, sight-reading) and have an AI-powered tool, such as PracticeFirst, give them feedback on the basics. Review the reports together and offer your own insights on tone, expression, and style.

2. Track Growth Over Time. Many AI platforms can give you data reports on student progress. Use these reports to create growth portfolios or graphs that show students how they're improving. It's great for parent conferences, too.

3. Self and Peer Assessment. Have students reflect on AI feedback: Do they agree with the score or comments? What would they change in their next performance? How do their peers' performances compare? It's a great way to build listening and critical thinking skills.

4. Theory and Ear Training Quizzes. Use AI-driven theory platforms for quick, adaptive assessments. Students can work at their own pace, and you can focus class time on problem-solving and deeper understanding.

5. Creative Assignments with AI Support. When students are composing, let them use AI to check for voice leading or harmonic accuracy. But take it

a step further—ask them to explain their artistic choices and how they made the piece their own.

What About Chatbots? Can They Help with Assessment?

AI-powered chatbots can be an effective tool for informal assessment, especially when it comes to gauging student understanding of music concepts. Imagine a chatbot acting as a virtual "study buddy" that quizzes students on music theory, history, or even performance practices.

Students can interact with the chatbot by answering questions, explaining concepts in their own words, or even engaging in simulated interviews (e.g., "Explain the difference between major and minor scales" or "What was Beethoven's influence on the Romantic era?"). The chatbot can provide instant feedback, clarify misconceptions, and even suggest follow-up activities or resources for review.

For example, you could create a chatbot (or use an existing one) to run through an aural skills drill, asking students to identify intervals or chord progressions. Or have them analyze short musical excerpts and explain their reasoning in a conversational format. You'll not only be assessing their knowledge but also encouraging reflective thinking—without adding to your grading pile!

Making Assessment More Accessible for Everyone

One of the best things about AI-powered assessment is how it can support diverse learners:

- Students with disabilities can get visual feedback on pitch or rhythm accuracy, or practice with slower tempos.
- English language learners can rely on visual and audio cues rather than heavy text-based rubrics.
- Students working remotely or asynchronously can get immediate feedback without waiting for in-person lessons.

By giving all students access to personalized, immediate feedback, you make your classroom more inclusive.

Things to Keep in Mind

- **Bias and Cultural Considerations.** Since AI tools often focus on Western classical or pop traditions, be cautious when using them to assess music from other cultures. AI might not have the context to evaluate it appropriately. Trust your own expertise and consult current research in those moments.

- **Data Privacy.** Always check the privacy policies of the tools you use. Make sure student data is safe and that you're following your school's policies on FERPA and COPPA compliance.

- **Human First, Technology Second.** No AI tool can replace your professional judgment. Use AI to handle repetitive tasks so you can spend more time focusing on musical expression, connection, and mentorship.

Conclusion

AI can make music assessment easier, faster, and more personalized. It's not about replacing what we do—it's about freeing up time and energy so we can focus on the *art* of teaching music. Start small: Pick one tool, try one new thing, and see how it fits into your teaching. Before long, you'll find it's helping your students grow while giving you more time to be the awesome teacher you already are.

In music education, where creativity, human connection, and real-time feedback are essential, AI can serve as an assistant—streamlining administrative tasks, enhancing lesson planning, and personalizing learning experiences—so that educators can focus on what matters most: teaching, inspiring, and making music with students.

Questions for Reflection

- How do you currently assess your students? Are your assessment strategies authentic and do they provide thoughtful feedback about your musical goals for your students?

- What are some of the benefits of using AI for assessment? Do you foresee any drawbacks to using AI as an assessment tool?

- In what ways might you try to use AI next year to facilitate a component of curriculum writing, instruction, and/or assessment?

Applications and Implications: Productivity

Why AI Is a Game Changer for Music Educators

Music educators juggle ever-growing lists of responsibilities: lesson planning, grading, communication with parents and students, scheduling rehearsals, managing performances, and handling administrative paperwork. These demands often leave little time for creative instruction and student engagement. AI can help ease these burdens by automating repetitive tasks and streamlining workflows.

As with any tool, AI requires professional and personal discernment, to be used as a supplement for and not a replacement for original thought and creativity.

Automating Administrative Tasks with ChatGPT

AI-Powered Communication

- Drafting parent emails, newsletters, and announcements
- Generating responses for frequently asked questions from students and parents
- Example: ChatGPT generates a template for an ensemble trip permission letter in seconds

Scheduling and Time Management

- Using ChatGPT or Music Educator specific GPT/AI tools to assist with rehearsal schedules, concert programs, and event planning
- Creating automated reminders and follow-ups for deadlines
- Example: AI-generated detailed itineraries for band trips or marching band competitions

Grant Writing and Funding Applications

- Helping educators quickly draft grant proposals for funding programs and equipment
- Assisting in refining and proofreading applications to sound more professional
- Example: ChatGPT structures a grant request for new instruments in a persuasive way

AI for Curricular Support and Lesson Planning

Generating Custom Lesson Plans

- Creating detailed, standards-aligned lesson plans for music theory, history, and performance
- Adapting plans based on student age, skill level, and curriculum goals
- Example: A band director asks ChatGPT to generate a warm-up routine for a beginner brass ensemble

Developing Classroom Activities and Assessments

- AI-assisted composition prompts, rhythm exercises, and ear training drills
- Automated quiz/test creation for music theory and history
- Example: ChatGPT generates a multiple-choice quiz on jazz improvisation techniques

Supporting Differentiation & Accessibility

- Creating individualized learning materials for students with different needs
- Adapting sheet music and lesson materials for students with disabilities
- Example: AI suggests simplified sheet music for a student with limited mobility

AI for Feedback, Assessment, and Student Engagement

Encouraging Student Engagement with AI

- AI-generated historical context for composers and musical pieces
- Example: Students input a song title and AI generates historical background and analysis

Grading and Assessment Assistance

- Creating rubrics and feedback language for evaluating performances and written assignments
- Example: AI suggests ideas for categories of constructive feedback on students' skill development and expression

Examples of AI Tools

ChatGPT – Lesson planning and communication
Moises – Audio separation for practice
Soundtrap – Collaborative music composition

PracticeFirst – Automated practice assessment
MakeMusic Cloud (formerly SmartMusic) – AI-assisted practice and assessment
MuseScore – Create and adapt sheet music
Band-In-A-Box – AI-generated 5-part accompaniments for jazz and classical
Baton-Sync – Music library, equipment, uniform, contact management, etc.

Conclusion

AI should be viewed as a support system that enhances productivity without diminishing the role of human creativity and expertise. By leveraging ChatGPT and other AI tools wisely, music educators can reclaim time, focus on artistic instruction, and build stronger learning communities.

Questions for Reflection

- What areas of your current organizational habits as a music educator are working very well? Where are your biggest challenges from a time management and productivity standpoint? How could AI help?
- What is one thing you are interested in trying with AI to see if it can provide you with more time and energy for more important priorities?

Coda

As this document illustrates, the rapid integration of multiple forms of AI technology into daily life has created significant shifts in society, education, and the arts. While these advancements have streamlined access to information and fostered global connectivity and access, they also present a paradoxical challenge. As so many areas of life are impacted by a reliance on technology and digital platforms, we may find an increase in the demand for music education and the communal nature of music-making. While technology continues to shape educational landscapes, many disciplines—music included—are grappling with how to maintain essential human elements of learning in an increasingly digital world. Music education, in particular, is deeply rooted in the process of creating, performing, and sharing music, all of which require a level of interpersonal connection and collaboration. As a result, music educators are now tasked with creating and implementing a curriculum that strikes a balance between technology and preserving the elements of musicality and human connection that are at the heart of the art form.

AI tools must be thoughtfully integrated into curricula in ways that promote critical thinking and encourage students to make connections between what they learn and the world around them. Curricular decisions in music education are inherently rooted in the principle of expanding students' musical thinking and understanding. Music educators aim to guide students through a journey where they not only learn how to perform or compose but also begin to understand the deeper theoretical, cultural, and emotional contexts of the music they engage with.

"By embracing both the opportunities and challenges posed by technology, music educators can continue to thrive in an ever-evolving world, expanding students' musical understanding while honoring the core values of human interaction, creativity, expression, and collaboration that are integral to the art of music."

As the field continues to evolve in response to technological advancements, it is essential that music educators remain focused on this broader goal. Digital tools and platforms may be used to enhance, rather than replace, the core of musical understanding. As the authors of this document have demonstrated, music production software, online tutorials, and virtual modeling, among others, can be effective tools for learning and creation. Generative AI programs can offer personalized learning pathways that enable students to explore, connect, and respond to musical concepts at their own pace. This gives music educators the opportunity to reevaluate what it means to "know" music in the 21st century, helping students to acquire a digital literacy necessary to navigate a world where music creation and consumption are increasingly mediated by technology.

This includes understanding digital audio workstations, music production techniques, and the ethical implications of music in the digital age. By expanding students' musical thinking in both traditional and modern contexts, educators can foster a comprehensive understanding of music that prepares students for a rapidly changing musical landscape.

AI will continue to reshape how students and society "know" music, requiring the need for consistent research, reflection, and exploration. How might music educators strike the right balance between utilizing digital tools and maintaining the social, collaborative aspects of music-making? What are the most effective strategies for integrating technology into curricula in ways that truly enhance musical understanding and creativity, rather than detracting

from them? Can technology ever truly replicate the communal experience of making music in person? How can we best use emerging technologies, such as virtual reality or AI-powered music programs, to create meaningful and immersive musical experiences that encourage human connection and growth?

In addition to the ongoing decisions about when and how to utilize AI in our classrooms, there will be broader considerations as well. In the future, AI has the potential to lower the cost of individualized instruction and change the structure of schooling. It will be important for music educators to monitor and adapt to changes in the structures of schooling that result from the wide availability of more affordable 1:1 instruction. How will music be included in AI-based instruction? How will AI affect the structure and delivery of instruction? If AI radically changes the schedule and structure of a school day, how and where will music instruction fit in that day, and what kind of music instruction will it be?

Similarly, AI has the potential to lower the cost of the creation of music, including the potential of music that is written for one individual in a specific moment, perhaps interacting with that person's physiological responses. This new category of individualized music will create questions and considerations for music

educators. How will music teachers educate students to lead or follow their personal AI composer in their listening experiences? How will we guide students in the difference between listening to music that was written for broad audiences and music that is written specifically for them? How can we ensure that students are exposed to new musical experiences that they may not encounter if they are only shown content that aligns with personal algorithmic preferences?

As AI continues to bring new consideration for music educators, it will be important for individual music educators and the field of music education as a whole to engage in finding answers, anchored by clear understanding of the core principles of music education. As technology plays an increasingly central role in music education, it is essential that music educators remain grounded in the belief that music is not merely a skill to be learned but a powerful means of human expression and shared experience. By embracing both the opportunities and challenges posed by technology, music educators can continue to thrive in an ever-evolving world, expanding students' musical understanding while honoring the core values of human interaction, creativity, expression, and collaboration that are integral to the art of music.

We want to hear from you! *Take this short survey* https://bit.ly/AIMusicEdSurvey *to share with NAfME your thoughts on AI and music education and in what ways you are using AI in your music teaching.*

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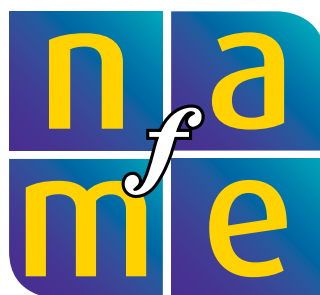
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