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PERCEPTION OF TEACHERS ON THE APPLICATION OF ARTIFICIAL INTELLIGENCE (AI) IN MUSIC EDUCATION

Abstract

Artificial intelligence in music education is a trending topic among teachers and learners, particularly with regard to its integration in the classroom. It is therefore imperative to investigate the extent to which this integration is or will be (un)successful in educational settings. Using a survey method with a purposive sample of 81 music educators from Abuja, Port Harcourt, and Abeokuta, the research explored four key areas: current awareness and experience, perceived benefits, concerns and challenges, and prospects. Findings indicate a strong awareness of AI's growing influence ($M=3.79$) and its potential benefits for personalization ($M=4.06$) and accessibility ($M=4.12$). However, a significant gap was identified between awareness and formal training, with only 8.6% of respondents having received some form of training on how to use AI. Respondents raised major concerns regarding the impact of AI on musical creativity and originality ($M=4.03$), replacement of human teachers, and cost implications ($M=3.64$). The study shows a strong consensus ($M=4.52$) on the need for formal AI training in teacher education and recommends a structured framework for integrating AI as a supportive tool that augments, rather than replaces, human music pedagogy.

Keywords: Artificial Intelligence, Music Education, Teacher, Creativity, Pedagogy

Introduction

A survey on the rapid advancement of artificial intelligence (AI) reveals a profoundly transforming trend in the creative and educational spaces. Music education, which is an arm of the creative arts, is already experiencing a significant paradigm shift due to AI. There is a shift from traditional master apprentice model towards a model that augments learning with intelligence technologies. Currently, there are AI-powered tutoring systems like Flowkey, Yousician, and SmartMusic that offer personalized practice routines (Qiu, Shaharom & Cheah, 2025); there are automated compositional tools like AIVA and Amper Music that generates harmonic accompaniment (RaNa, 2025). Tonara and Melodics are sophisticated software that provide real-time objective feedback on rhythm and theory of music (Qiu, Shaharom & Cheah, 2025). AI applications possess the possibility to fundamentally revolutionise how music is taught, practiced, and learned. These AI tools democratize learning such that resources exclusive to learners in developed countries are also accessed by students in a developing country like Nigeria.

Despite the seemingly exciting opportunities, successful integration of new educational technology is dependent on its adoption and implementation by educators. Tarling & Ng'ambi, (2016); Loveless, (2011); Hughes, (2005) observe that the most advanced tools remain inert without the pedagogical expertise of teachers. The teacher is the human element that acts as an essential conduit through which technology effectively flows to the students. The right perception, understanding, aptitudes, and attitude determine whether AI tools are effectively leveraged to enhance pedagogical outcomes or results in underutilization in the classroom.

Previous studies have explored the technical capabilities and the theoretical implications of artificial intelligence in music (Mwita & Owino, 2025; Yang et al., 2024; Zhao & Liu, 2022). However, there is limited empirical research focusing on the human element; the music teacher responsible for implementing the pedagogical shift. Existing studies have speculated on what AI can do, but have been silent on teachers' perception about what AI does. It is important to

understand teachers' viewpoints, level of confidence in using tools, as well as their fears about obsolescence and the degradation of artistic creativity. This information will come in handy when developing teacher training programmes, drafting ethical guidelines, and creating strategies that will aid the sustainable implementation of AI by stakeholders.

This paper's focus, is on the neglected perceptions of music teachers regarding the application, benefits, and challenges of artificial intelligence in music education. Based on an expanded study of 81 educators from three strategic locations (Abuja, Abeokuta, and Port Harcourt) in Nigeria, this research moves beyond speculation, it provides evidence-based analysis of the level of teachers' readiness. It identifies key areas where teachers express optimism and areas where they experienced apprehension, thereby establishing a foundation for concrete recommendations.

The integration of artificial intelligence in education, a field often referred to as AIEd (Artificial Intelligence in Education), has been the subject of growing scholarly interest over the past decade. Researchers like Mwita and Owino (2025) championed its potential to revolutionize learning. They posit that AI improves learning through highly personalized learning pathways for students, automating routine tasks so that teachers save time, and offering intelligent tutoring systems for real-time feedback. This plethora of promises calls for critical reflection, as successful implementation depends on several factors, of which those that concern teachers are key.

In music, the evolution of AI applications has been transformative, offering several capabilities that are directly applicable to pedagogy. As noted by RaNa (2025), these include software for real-time performance analysis, provides feedback on intonation and sight-reading techniques. There are also AI-powered notation programmes that transcribes audio recordings into sheet music instantly. In addition, Qiu, Shaharom, and Cheah (2025) listed interactive systems that can accompany a student's improvisation based on their dynamic musical choices. These systems represent a shift from AI as a novel technology to AI as a partner in music learning and creation.

It is widely acknowledged in literature that AI's capacity to promote inclusivity is one of its attractive features. Through an integrative review of 27 papers, Dumitru et al. (2025) listed several AI tools and matched them with disability types. Their findings revealed that there are AI-powered tools with the potential to make music education more accessible to students with disabilities through adaptive interfaces, alternative control mechanisms, and assistive

technologies. Therefore, translating musical ideas into sound and vice versa becomes easier. Furthermore, the pragmatic advantages of AI are obvious in the comparative analysis of the music transcription of the Tatar Kryashen songs using three AI-powered programmes: Celemony Melodyne, AudioScore Ultimate, and Cubase. Liu and Benetos' (2021) work, revealed that AI provides a user-friendly interface that aids quick analysis of audio recordings, quick creation of music notations, recreation of damaged audio sounds, and enhancement of sound quality for easy analysis. This software can also provide objective, data-proven analysis of technical proficiency, thereby complementing the role of a human creative.

Existing literature is far from uniform optimism, there are studies that reveal profound concerns. Scholars like Huang (2025), Fernando, Mahanama & Wickramasinghe (2024), Novelli & Proksch (2022), Dahlstedt (2021), and Rubinstein (2020) have expressed reservations around aesthetics and emotion in AI-generated music. They described AI-generated music as musical sounds that are technically proficient but artistically sterile, lacking human touch, subjective experience, and deep emotional connection. Their conclusions lead to a broader ethical concern regarding authorship, creativity, and the potential devaluation of human expertise. If a student can generate a complex composition with just a few prompts, what becomes of the painstaking process of learning music theory, compositional techniques, and instrumental skills? Ahmed, Soomro and Naqvi (2024) identified significant practical barriers to the adoption of AI in music education as the high cost of proprietary software, the persistent digital divide, and the widespread lack of professional development in AI integration. These major impediments prevent effective integration of these AI tools into pedagogical practice.

While existing literature has thoroughly mapped the technological capabilities of AI in music education, there is still a comparative lack of empirical research that captures the voice of the end users. The perceptions, experiences and concerns of music teachers are critical filters through which any technological innovation must pass through for successful adoption. Therefore, this study builds upon the established research by quantitatively assessing the perception of practicing music teachers in a bid to bridge the gap between potentials of technology and pedagogical reality.

Methodology

This study employed a quantitative survey design to collect data on the perception of music teachers. A purposive sample of 81 music teachers was selected from three different locations to ensure contextual diversity. The sample distribution is as follows: Location A (n=33), Location B (n=20), and Location C (n=28). This uneven distribution was strategically designed to maintain continuity with a cohort from a pilot study in location A (Abuja). This was done to ensure consistency in tracking responses and building on prior findings, while introducing new contexts that informed the selection in locations B (Port Harcourt) and C (Abeokuta). With this, the scope of the study was broadened, allowing sampling across different geographical settings.

Music teachers who took part in the study were selected based on the following criteria: they had had formal music training in a tertiary institution, they had been teaching music for at least five years, they were aware of the existence of artificial intelligence, and they agreed to participate in the study.

Data was collected using a 5-point Likert Scale questionnaire divided into four sections to capture perceptions around awareness, benefits, challenges, and prospects. The data collected was analyzed using descriptive statistics, mainly frequency count, mean, and standard deviation. While recognising the presence of gender variations within the study population, the research does not treat gender as a primary analytical variable, as it does not bear directly on the phenomena under investigation. The focus is instead directed toward core parameters associated with the perceptions of music teachers (regardless of gender) on the application and implications of artificial intelligence in music education, which are more critical to achieving the study's aims.

Results and Discussion

Presented in this section are the findings from the study, which explored the perception of artificial intelligence's (AI) integration in music education among 81 secondary school music teachers. Findings are presented under four thematic areas: current awareness and experience, perceived benefits, concerns and challenges, and prospects.

Current Awareness and Experience

Table 1: AI Awareness and Experience among Music Teachers

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	M	SD
I regularly use AI tools for personal activities	12	17	22	25	5	3.36	0.98
I possess a good understanding of how AI applications function	5	8	20	40	8	3.70	0.98
I am knowledgeable about AI tools applicable to music teaching	6	7	22	38	8	3.76	1.06
AI innovations are shaping the way I teach music in the classroom	4	6	18	44	9	3.79	0.74
I have undergone formal training related to AI technologies	12	25	37	5	2	2.52	0.94

Majority of music educators reported familiarity with AI and its applications. Mean scores indicate moderately high awareness and confidence in using AI for teaching ($M = 3.70 - 3.79$), and 64.2% of respondents reported prior use of AI tools. Despite this, formal training was significantly limited, with only 7 (8.6%) people agreeing and strongly agreeing that they had received structured instruction. Also, 30 out of the 81 respondents agree and strongly agree that they use AI for personal tasks, while 29 disagree and strongly disagree.

This gap between awareness and formal training suggests that while AI use is a growing phenomenon, it is largely informal and self-directed. Research has shown that technological adoption without professional development limit effectiveness and lead to inconsistent pedagogical practices (Selwyn, 2019). Teachers' conceptual readiness shows some promises, but full integration is unlikely to succeed unless formal training is implemented. Teachers need to be equipped with the skills to leverage AI safely, ethically, and creatively in music classrooms. The significant difference in number between teachers who do not personally use AI regularly (29) and those who claim awareness or instructional use (46-53) may be a reflection of the need to belong which forces people to identify with the majority so as not to feel that they don't know.

Furthermore, the significant difference in number between teachers who do not personally use AI regularly (29) and those who claim awareness or instructional use (46-53) may indicate the influence of social desirability, where respondents align themselves with what appears to be the

dominant or expected practice. This tendency is well documented in self-reported research, particularly in emerging fields where technological competence is socially valued (Krumpal, 2013; Nederhof, 1985). In the context of AI in education, studies have shown that educators sometimes overstate their familiarity with digital tools to avoid appearing less knowledgeable or technologically behind their peers (Zawacki-Richter et al., 2019; Ifenthaler & Schweinbenz, 2016). This may partly explain the higher numbers of teachers claiming awareness or usage of AI tools for teaching, despite a smaller group reporting consistent personal use. Such patterns call for cautious interpretation of self-reported data and reinforce the importance of triangulating surveys with observational or performance-based measures.

Perceived Benefits

Table 2: Perceived Benefits of AI in Music Education

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	M	SD
AI literacy should be integrated into teacher education programmes	2	3	12	29	40	4.33	0.74
AI tools can personalize learning experiences	3	5	12	35	26	4.06	0.70
AI-assisted transcription enhances musical analysis	4	6	15	30	26	4.00	0.87
AI can support learners in composition and improvisation	3	4	11	32	31	4.09	0.72
AI improves accessibility for students with disabilities	2	5	17	37	27	4.12	—

The highest-rated item, integration of AI literacy into teacher education ($M = 4.33$), highlights a widespread recognition of the need for structured instruction. Teachers also rated personalized learning ($M = 4.06$), support for composition and improvisation ($M = 4.09$), and accessibility ($M = 4.12$) as important benefits.

The overall statistics in Table 2 reveal that the respondents strongly endorsed AI as a pedagogical aid. These findings suggest that educators perceive AI as a tool that can enhance personalised learning and improve accessibility, particularly for students with disabilities. These perceptions align with research on AI in education, which emphasizes its role in differentiated instruction, adaptive learning, and inclusive teaching (Luckin et al., 2016; Al-Azawei, 2020). Such benefits

indicate a high potential for successful integration, provided that teachers receive the necessary training, administrative support, and resources to implement AI effectively in classrooms.

Concerns and Challenges

Table 3: Concerns and Challenges Associated with AI in Music Education

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	M
AI poses concerns regarding creativity and artistic originality	10	10	7	29	25	4.03
AI integration may diminish the traditional role of human teachers	5	25	22	22	7	3.03
The financial cost of AI tools represents a significant barrier	7	7	25	39	10	3.64
Music produced by AI lacks emotional depth	6	9	21	34	11	3.67

Creativity and originality (M = 4.03) were the primary concerns, reflecting the fears of teachers that AI could homogenise artistic output or limit authentic expression. Cost (M = 3.64) and perceived lack of emotional depth in AI-generated music (M = 3.67) were also reported as significant barriers. There were divided opinions regarding AI rendering the traditional roles of teachers redundant (M = 3.03).

Despite recognizing the benefits of AI for music education, teachers expressed considerable concerns, especially regarding the preservation of individual creativity. These findings are consistent with literature highlighting AI's limitations in artistic creativity and emotional depth (Pasquinelli & Jarke, 2022; Miralda, 2022). In a developing country like Nigeria, cost and infrastructure issues are particularly salient as they potentially limit large-scale adoption and sustainability (Olojo, Adewumi, & Ajisola, 2021).

Majority of the respondents agree that AI cannot replicate human creativity or the emotional connection that is felt when humans compose music. However, a few respondents challenge these assumptions as they disagree that AI poses a concern regarding creativity and artistic originality. For a successful adoption, music teachers will have to embrace AI as a complementary tool that supports and augments their efforts rather than substitute their creative and instructional roles.

Prospects

Table 4: Prospects and Future Expectations for AI Integration in Music Education

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	M	SD
Prospective music teachers should be required to receive formal AI training	0	0	5	29	47	4.52	0.62
AI integration will lead to innovative teaching methodologies	2	3	15	40	21	4.15	0.67
AI-driven assessment tools will enhance music learning outcomes	3	7	20	35	16	3.67	0.89
AI integration requires continuous research and policy development	1	1	5	32	42	4.36	0.60

Table 4 shows that there is an overwhelming support for formal AI training ($M = 4.52$). This is confirmation of an earlier report (Table 2), which signifies teachers' readiness to adopt AI in music education. Respondents also believe that AI will bring up new teaching methodologies ($M = 4.15$) and enhance learning outcomes ($M = 3.67$). The highest consensus ($M = 4.36$) is on the need for research and policy development, highlighting a systemic approach to integration.

This indicates a progressive perspective, where teachers anticipate AI becoming a co-teacher in music education. Research aligns with this vision, emphasizing that sustainable AI adoption depends on teacher preparation, institutional support, and clear ethical and pedagogical guidelines (Luckin et al., 2016; Webster, 2020).

With structured training and research-informed policy, AI integration is likely to be successful. But for higher success, there is need for ongoing research and continuous development targeted at enhancing creativity, inclusivity, and pedagogical innovation in music education.

Conclusion

This study demonstrates that the perceptions of music teachers are critical to shaping the trajectory of AI application in music education. Teachers recognise that the future of Artificial Intelligence-infused music education will promote accessibility, personalized learning, and individualized support. Nevertheless, they also gaze into the future with caution and

apprehension about the erosion of creative depth and the potential devaluation of their role as human instructors. This is why the study intentionally shifts from conventional technological and theoretical inquiries to a more human-centered approach to examine how music teachers perceive the applications and implications of AI integration in music education.

Findings revealed that although music teachers demonstrated moderate to high levels of awareness regarding AI applications, formal training remained largely absent. This absence has created a notable gap between familiarity and professional readiness. Teachers strongly acknowledged the benefits of AI, particularly its potential to enhance personalised learning, support creative tasks such as composition and improvisation, and improve accessibility for learners with disabilities. However, concerns about the loss of artistic originality, the emotional limitations of AI-generated music, and the cost implications of adoption remain significant barriers. Despite these challenges, respondents are hopeful that in the future, AI will be a viable tool for music education, provided that systemic support and capacity building are prioritised.

To build upon this study, future research should adopt longitudinal and comparative methods. A longitudinal study can track a cohort of teachers through an ongoing AI integration programme. This will likely yield valuable insights into how perceptions and pedagogical practices evolve when exposure and support are sustained. Furthermore, comparative research examining the perceptions of music teachers across different cultural and educational contexts would help distinguish and categorise challenges based on specific barriers. The findings will inform the development of contextual and relevant implementation strategies.

References

- Ahmed, J., Soomro, A. K., & Naqvi, S. H. F. (2024). Barriers to AI Adoption in Education: Insights from Teacher's Perspectives. *International Journal of Innovations in Science & Technology*, 7(1), 411-421.
- Dahlstedt, P. (2021). Musicking with algorithms: Thoughts on artificial intelligence, creativity, and agency. In *Handbook of artificial intelligence for music: Foundations, advanced approaches, and developments for creativity*. 873-914. Springer International Publishing.
- Dumitru, C, Muttashar Abdulsahib, G, Ibrahim Khalaf, O., & Bennour, A. (2025). Integrating artificial intelligence in supporting students with disabilities in higher education: An integrative review. *Technology and Disability*.
<https://doi.org/0.1177/10554181251355428>

- Fernando, P. N. K., Mahanama, T. V., & Wickramasinghe, M. (2024). *Assessment of Human Emotional Responses to AI-Composed Music: A Systematic Literature Review*. <https://doi.org/10.1109/scse61872.2024.10550861>
- Huang, L. (2025). *An Interdisciplinary Study of the Unconscious Structures in AI-Generated Music Based on Suno*. 1(1), 1–9. <https://doi.org/10.71113/jcac.v1i1.283>
- Hughes, J. (2005). The role of teacher knowledge and learning experiences in forming technology-integrated pedagogy. *Journal of technology and teacher education*, 13(2), 277-302.
- Liu, L., & Benetos, E. (2021). From audio to music notation. In *Handbook of Artificial Intelligence for Music: Foundations, Advanced Approaches, and Developments for Creativity* (pp. 693-714). Springer International Publishing.
- Loveless, A. (2011). Technology, pedagogy and education: Reflections on the accomplishment of what teachers know, do and believe in a digital age. *Technology, Pedagogy and Education*, 20(3), 301-316.
- Mwita, K., & Owino, R. (2025). Transformation of music education in Sub-Saharan Africa: An assessment of artificial intelligence applications. *Journal of Music and Creative Arts (JMCA)*, 4(1), 53–65. <https://doi.org/10.51317/jmca.v4i1.727>
- Novelli, N., & Proksch, S. (2022). Am I (deep) blue? Music-making AI and emotional awareness. *Frontiers in Neurorobotics*, 16, <https://doi.org/10.3389/fnbot.2022.897110>
- Qiu, S., Shaharom, M. S. N., & Cheah, K. S. (2025). Human-AI collaboration and learning analytics in a piano CMOOC: Psychological insights into motivation and self-regulated learning among high school students. *TPM-Testing, Psychometrics, Methodology in Applied Psychology*, 32(4), 1-16.
- RaNa, M. R. H. (2025). The Impact of Artificial Intelligence on Music Composition and Performance. *International Journal of Technology, Management and Humanities*, 11(01), 17-34.
- Rubinstein, Y. (2020). Uneasy listening towards a hauntology of AI-generated music. *Resonance*, 1(1), 77–93. <https://doi.org/10.1525/RES.2020.1.1.77>
- Tarling, I., & Ng'ambi, D. (2016). Teachers pedagogical change framework: A diagnostic tool for changing teachers' uses of emerging technologies. *British Journal of Educational Technology*, 47(3), 554-572.
- Yang, W., Shen, L., Huang, C. F., Lee, J., & Zhao, X. (2024). Development status, frontier hotspots, and technical evaluations in the field of AI music composition since the 21st century: A systematic review. *IEEE Access*, 12, 89452-89466.

Zhao, Y., & Liu, W. (2022). Analysis of music teaching in basic education integrating scientific computing visualization and computer music technology. *Mathematical Problems in Engineering*, 2022, 1-12.