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TRANSFORMATION OF MUSIC EDUCATION IN SUB-SAHARAN AFRICA: AN ASSESSMENT OF ARTIFICIAL INTELLIGENCE APPLICATIONS

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Abstract

This study reviews the use of AI in music education in sub-Saharan Africa. The study applies the systematic literature review method and specifically employs the PRISMA approach to review and report on the use of AI in music education in sub-Saharan Africa. The results gathered from this review study's investigation show that AI positively influences music education in several ways, including personalised learning, assisted music composition, intelligent tutoring, automated assessments and skill development. The research found that artificial intelligence helps learners to have immersive learning experiences with their teachers, become better music creators and gain crucial skills in music composition and production. Using selective literature review and content analysis, the research shows that the region has significant potential in aligning education policies with artificial intelligence applications for better music learning outcomes. Despite AI's transformative potential in music education, challenges surrounding technology adoption, internet penetration and teacher training in sub-Saharan Africa impede its full utilisation. The use of the flipped classroom model, however, can help sub-Saharan Africa reap the benefits of AI in music education in the meantime. Government and non-governmental organisations should invest more in digital education infrastructure and technological resources to unlock the full potential of AI in music education and education in general. Future research should also look into such investment in the sector, to identify gaps, opportunities and inform policy frameworks to accelerate infrastructure development, and ultimately, accelerate AI adoption and application in music education.

Key words: Artificial intelligence, machine learning, music education, music industry, sub-Saharan Africa.

1.0 INTRODUCTION

While artificial intelligence presents an interesting dispensation to the African continent and global community on a wider scale, the implementation of AI systems in music education within sub-Saharan Africa remains underexplored. The new technological evolution has significant possibilities and precipitates future optimism in the application of computer technologies to better human lives. In a simpler definition, artificial intelligence (AI) is the computer-related capability that enhances the ability of machines to function with a significant level of intelligence that mirrors human capabilities in acting, comprehension and sensibility (Pillay, 2020). By modern standards, AI is relatively a new field with growing applications in areas such as education, health and agriculture. It has opened a pathway where machines learn to emulate human behaviour and perform roles once dominated by practical execution by individuals. Machines now understand human emotion and expression, with abilities such as reading a game or understanding traffic signs.

The music industry has joined the artificial intelligence conundrum with a number of tasks and applications influenced by machine learning activities. Using the computer hardware and software technologies, artificial intelligence can perform tasks such as image recognition, audio processing and natural language processing. Music learning has started integrating AI capabilities in synthesising aspects such as instruments' timbre (Qiusi, 2022). Applications have since developed into more areas, including music composition, production, intelligent tutoring and digital education.

In this study, Artificial intelligence is defined as the technology providing for the simulation of human intelligence processes such as creativity, comprehension, problem solving, decision making, and human learning. Machine learning is defined as the development and application of artificial intelligence in computer systems to use algorithms to learn, adapt and operate without explicit instructions. Music education is defined as the teaching and learning of music, from its history, theory and history, to its development and performance. The term music industry is defined as the ecosystem of individuals and businesses involved in the entire chain of music creation, production, promotion and monetisation. Sub-Saharan Africa is defined as the area of the continent of Africa that lies south of the Sahara Desert.

Artificial Intelligence in the Music Industry

Artificial intelligence and computer algorithms have significantly impacted human life in many dimensions, including music production and performance. The artificial intelligence tools aid in recording of quality music, following previous progress like the invention of the phonograph in the 19th century and cassette discs in the 19780s, which enhanced sound quality and prolonged playtime (Kavinmathi, 2024). AI has further enhanced various areas in music production and distribution, citing improvements in data insights, creativity in music conceptualisation and individualised music consumption experiences. AI has enhanced capacities including music composition, transcription and "playing instruments using robots" (p. 2). Music education has improved with the increased adoption of artificial intelligence technologies. For example, Qiusi (2022) observed that the use of AI technology has led to "increased satisfaction among students, teachers and parents" (p. 1). The impact is felt in the increased quality of music learning, with enhanced audio computational capacities of modern instruments that support the acquisition of universal music education.

Further, inclusion of artificial intelligence in music education has proved to be a pedagogical resource leading to customised learning experiences and efficient delivery of learning content (Merchán et al., 2024). Artificial intelligence systems enhance real-time feedback when students are engaging in music practices. Moreover, they enhance the assessment of performance aspects and provide virtual assistants when dealing with music compositions. The automated experiences build a blended learning environment where learners veer from a traditional instructional classroom to a more engaging music content, performance, and understanding of expressive and practical aspects of music creation.

Artificial Intelligence and Music Education in Sub-Saharan Africa

Africa has an existing rich music tradition. The continent has embraced traditional music creations and infused contemporary trends to create fulfilling musical experiences. Musicians within African countries have adopted modern music practices in their songs and performances, hence creating the necessity for enhanced education processes. The growth in the music industry in sub–Saharan Africa and beyond has created opportunities in human development, facilitating opportunities for vocational training in higher learning institutions to foster digital literacy for better musical talents (World Bank Group, 2021). The emergence of special courses focusing on music education has enhanced the ability of musicians to harness their skills.

The music schools have supported "artistic development, music production and branding" (p. 11). Africa is ready for the use of technological aids, including artificial intelligence, to hone music skills. For instance, Ekpo (2024) noted the involvement of learning and training programs for oral traditions in the African context and Western music styles that include performance and composition methodologies. The integration of AI into music learning improves capabilities in exploring African idioms and cultural connotations within music compositions. Artificial intelligence capabilities also enhance technical capacities in data analytics, audio processing and music production. The research aims to fulfil two objectives. The first one is to determine the influence of artificial intelligence on music learning in sub-Saharan Africa. The second objective is to establish artificial intelligence's application areas in music learning ecosystems in sub-Saharan Africa. Therefore, the research will explore the use of AI in music education in the sub-Saharan Africa context, specifically focusing on its influence, appropriate application areas, as well as its impact and implications. It is expected that findings will indicate a rapid adoption of AI in music education, particularly in the areas of self-paced digital learning systems and machine-driven tutoring. Further, it is expected that AI will be found to have resulted in increased uptake of music education in sub-Saharan Africa, owing to factors such as personalisation, seamless learning experience, and the scalability of instruction.

2.0 LITERATURE REVIEW

Artificial intelligence is gaining traction globally and has progressively impacted how various sectors, including health, arts and education, function. The review of current literature shows how AI has influenced the music industry, music education and current applications.

Introduction of Artificial Intelligence to Music Learning

Sub-Saharan Africa has leaned towards digital solutions within music, art and other industries. Intelligent Systems Group is an automated AI application in South Africa, offering intelligent research solutions in areas such as music, image processing and remote sensing (Butcher et al., 2021). In Kenya, Strathmore

University has developed @iLabAfrica Research Center that fosters research and consolidates activities that unravel technological advances in AI and related technologies. Such programs align with the development targets for the country's Vision 2030. Although sub-Saharan Africa is still in the budding stage of artificial intelligence development, it has made significant progress. While Mauritius has a national AI strategy for learning in its K-12 institutions, Kenya is making progress in technological applications within the classroom delivery of music content (Oyelere et al., 2022). Sub-Saharan African nations are considering integrating information and communication technologies into their curricula, but encounter significant drawbacks (Nsolly & Charlotte, 2016). The region is least developed in AI applications in its science-related or music education, given the foundational challenges. Despite this reality, AI continues to be part of daily human lives, and Africans have to contend with its continued growth in offering automated solutions to human problems.

The current changes in socioeconomic trends within African countries have led to opportunities for artificial intelligence indulgence. The post-COVID-19 period uncovered the underlying underdevelopment of the online teaching and learning sector, leading to the adoption of digital technologies within the sub-Saharan region (Kolog et al., 2022). African countries have progressively engaged in creative activities that support an increasing AI role in cultural and creative industries. Franco and Njogu (2020) reiterated the efforts by sub-Saharan African countries to engage in cultural diversity interventions to attain their development goals. Some programs involved in the cultural and sustainable development agenda include artistic creation and online content distribution. Artificial intelligence is useful to digital programs involved in music education, offering avenues for enhanced understanding of "interactive compositions and music synthesis" (Dannenberg, 2000). Ensemble performances become more practically informative with the use of AI tools when enhancing music comprehension and self-awareness amongst learners. More technical applications will evolve in sub-Saharan Africa given the current status of AI and music integration practices.

Applications of Artificial Intelligence in the Music Industry

The global entertainment industry has attracted technological solutions to the delivery of creative content. Sub-Saharan Africa has, however, suffered less discoverability in online platforms for its audio-visual content, due to dominance by Western automated video-on-demand platforms, including Netflix and Amazon Prime (Dugeri, 2024). The use of automated features on online music platforms in the music industry in South Africa has enhanced music streaming, hence more consumption of creative content (Nhlabathi, 2024). AI has also unravelled the impact on artists, helping musicians assess data on users' tastes, offering clarity on listeners' experiences from platforms such as Spotify and Apple Music (Olayeni, 2023). AI automations help the music platforms to suggest new tunes to their artists and keep consumers interested through customised music experiences. Consumers have become dependent on AI indirectly through algorithmic suggestions on their various music preferences (Venkatesh et al., 2022).

AI tools have newer applications within the music industry. Mbamba (2024) categorised several uses of AI tools, noting various functions such as: creation of songs (SOUNDEAW), customising track records (Beatoven.ai), recreation of audio styles to produce karaoke versions and music generation wizards that create different music styles (AIVA). In summary, AI tools influence the music industry through music production, songwriting, production, sound design and distribution. Artificial intelligence solutions have found application in music composition to influence structure, melody and instrumentation (Novikova,

2024). Such an undertaking requires a specific application, including the Generative Adversarial Networks or Variational Auto Encoders. Ma et al. (2021) elaborated that AI produces lyrics that correspond to the particular music style and accompanying melodies. AI tools such as Recurrent Neural Networks generate musical texts due to their capabilities in learning and language modelling (Chen & Lerch, 2020). According to Martin (2022), AI systems have enhanced music creation and are applied to live performance aspects by running a controller interface through the interpretation of the performer's actions.

Context of Sub-Saharan Africa and Artificial Intelligence

The education systems have experienced a paradigm shift due to the application of technological resources. According to Merchán Sánchez-Jara et al. (2024), artificial intelligence has transformed music education in the classroom, leading to efficient and personalised artistic skills within the creative industries. However, concerns loom over the possibility of new technologies creating more technological inequalities within developing nations or between them and their developed counterparts (Hamann, 2018). However, the contemporary African society is experiencing continued application of AI technologies in crucial sectors such as entertainment, agriculture and language learning. Kenya, Nigeria and Ethiopia have used AI in natural language learning and adopted it in crucial sectors like health and public transport. AI applications have gained traction in monitoring procreative health in Kenya using chatbots; enhancing modern agriculture in Nigeria; and piloting drones in West Africa for fishing activities (Yeboah, 2020). Further, locally developed AI tools through initiatives driven by software developers can advance educational outcomes. Despite the positive progress, AI has led to critical challenges that can lead to imbalanced technological development, leading to "unequal implementation that widens global inequalities" (Miller & Stirling, 2019).

Artificial intelligence has significant potential in positively impacting the entertainment industry, especially music and content generation. Gikunda (2023) reiterated that AI creates user-specific content, enhancing streaming and concise targeting of consumer groups. A compendium report by Butcher et al. (2021) identified that sub-Saharan Africa has significant opportunities for AI integration, citing the need for its use in enhancing skills and competence in education settings. Higher education institutions have a role in using AI initiatives to enhance training for women, minorities and diverse groups to ensure equality in research and education. In the 21st century, African music compositions also draw from artificial intelligence to brainstorm ideas, add styles and enhance creativity (Ekpo, 2024). Educational institutions can utilise these advantages to offer learning experiences on integrative music creativity. African musicians benefit from AI tools in enhancing creativity and infusing digital and cultural content from their contextual backgrounds for better quality music.

Pros and Cons of Artificial Intelligence Evolution in Music Learning

Artificial intelligence has led to enormous opportunities in music production and learning. Olayeni (2023) attested that AI technology has gained increasing use in the music industry, indicating various uses including: producing new songs, creating rhythms and interpreting existing song trends. Music students, therefore, have the opportunity to learn fresh ideas and incorporate styles within a minimal time. The algorithms generated by artificial intelligence capabilities enlarge the scale of music compositions and expand the scope of music creations (Novikova, 2024). Music students and performers can learn from AI systems to improve technical and practical skills in music-making. AI enables music learners to become more creative in pursuit of musical excellence. The AI generative tools help with music artists' productivity

by acting as music assistants in studios and inspiring musicians and learners to efficiently produce musical content. Further, artificial intelligence is beneficial to education processes by "offering real-time feedback, adjusting course content and evaluating student involvement through interactive learning strategies" (Nzoka, 2024). With such trends, AI improves the quality of classroom instruction and enhances the efficiency of the learning process. The technology advances in AI have added potential benefits to learners, including less human error in evaluation tests and learning processes, immersive learning and customising instructional materials to match students' needs (Nzoka, 2024).

Artificial intelligence and associated technologies, including virtual or augmented reality, require specific skills for appropriate comprehension and use (Mbamba, 2024). It is difficult to integrate AI learning systems within a classroom environment due to resource constraints and difficulties involved in acquiring technical tools for the educational process. Some users have also expressed concerns with 'digital noise' when applying AI tools in music algorithms, preferring human tone over artificial melodies (Novikova, 2024). Artificial intelligence may also interfere with copyrights due to difficulty in assigning intellectual rights to the original owner of AI content. Dehumanising the educational process may prove limiting to music learners if AI replaces human elements in the instructional process (Nzoka, 2024). Such systems make it difficult for students to comprehend music content. Technical failures by AI technology may also hinder smooth learning due to increased dependence on technology to deliver content within a learning classroom. Human touch is needed to keep the learning process balanced with increased adoption of AI solutions in the learning process (Kolog et al., 2022). Cumulatively, however, artificial intelligence has drawn interest from scholars and music practitioners, thus necessitating investigation into how AI systems, including tools and applications, influence music learning in sub-Saharan Africa.

3.0 METHODOLOGY

The study applied the systematic literature review approach, adopted by Merchán Sánchez-Jara et al. (2024), which assesses the use of AI technology in education systems in the promotion of artistic creativity, its use and integration of learning systems. The study utilised current literature (articles published within 10 years) to assess AI applications in music education and associated influence in sub-Saharan Africa. The research process adapted the PRISMA approach (Page et al., 2021), which identifies four phases of conducting systematic literature review as, firstly, identifying research questions; secondly, creating a search question; thirdly, deciding inclusion and exclusion standards; and fourthly, qualitatively selecting research articles for analysis from industry reports, conference papers and Google Scholar's library. The researchers preferred Google Scholar because it contains quality multidisciplinary research, with free access to quality content on artificial intelligence and music education.

Research Questions

1. How does AI integration influence music education in sub-Saharan Africa?
2. What are the appropriate application areas for AI technologies in music education systems within sub-Saharan Africa?
3. How does AI transform learning in sub-Saharan African schools in terms of teaching, student engagement and music education perspectives?

Search Equation

The researchers optimised the search equation from experimental tests on the most appropriate search results that align with the study topic. After refining the search criteria, the researchers came up with the following arrangement:

TOPIC: (search "Artificial intelligence" "AI" "Machine learning" "deep learning")
AND SECOND TOPIC: Music (education OR instruction* OR learning* OR curriculum*)*
WITHIN: ("sub-Saharan Africa," OR "African schools/ countries").

Inclusion and Exclusion Standards

The researchers included research work (articles, conference proceedings and reports) that met the following criteria:

(i) English publications within the last 10 years.
(ii) Peer-reviewed journals on Google Scholar, scholarly reports or conference publications.
(iii) Articles synthesising pedagogical areas in AI integration in education settings.
(iv) Articles presenting AI application tools for music education and digital education.
(v) Exclusion of research articles was based on:
(vi) Articles published outside the preferred period
(vii) Random articles that do not align with the refined research keywords, such as "AI", "machine learning", and "music education".
(viii) Articles that do not present quality research in journals, reports, or conference papers.
(ix) Articles that do not analyse the implementation of AI in educational contexts.
(x) The inclusion and exclusion standards aimed to present the highest-quality research for analysis in this study.

Selecting the Final Qualitative Sample

The researchers conducted a qualitative review of the study articles by conducting content analysis using the refined research topics. The review of the abstract, methods and findings led to a pool of quality papers used in subsequent analysis. The study settled on n=20 sample to reflect a critical focus on the best study materials appropriate for the research investigation.

4.0 RESULTS AND DISCUSSION

The focused synthesis of the existing literature on artificial intelligence and its application in the music industry and education shows critical discoveries for the sub-Saharan Africa region. The selective literature review and subsequent content analysis have identified five critical areas of AI application in music education as shown in Figure 1 below.

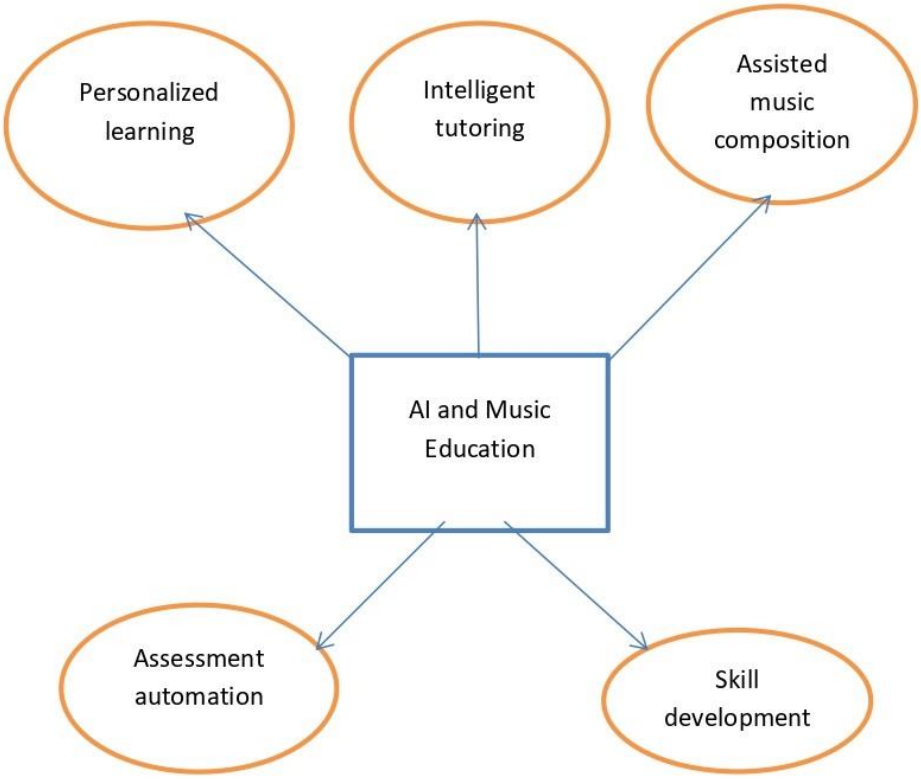

Figure 1. Application Areas of Artificial Intelligence in Music Learning Across Sub-Saharan Africa. (Author 2025).

Within the assessed articles, two areas of AI application in the selective review of literature stand out: personalised learning system (25%) and assisted music composition (25%). Intelligent tutoring (20%) follows closely, alongside skill development (20%). The least featured area of application is the assessment automations (10%). The ability of the AI systems to offer a personalised learning experience and enable music students to explore digital education is present in more than seventy per cent of the articles chosen for the study. This shows that AI helps students adopt an education system that suits their routines and capabilities (Merchán et al., 2024). Table 1 indicates the analytical assessment of selected literature as presented in this research (see Appendix 1). The application areas are explained as follows.

Personalised Learning

Personalised learning exemplifies the AI capabilities in empowering students with different artistic and learning potential to benefit from music education at an individual pace and with flexibility. The assessed articles show that AI applications are more practical in higher learning institutions. It offers music students a tailored learning experience, flexible study time, and enhanced music personality and artistic competence. Artificial intelligence also flips the music classroom, offering digital and offline instructional capabilities for simultaneous learning and practice. Interactivity between teachers and students also increases under AI, thereby enhancing student participation by guiding their performance and collaboration within the classroom. Jackson (2020) explained that early-year learning with associated AI technologies also enhances music education through captivating learning styles for better concentration and participation.

Intelligent Tutoring

Although AI has not replaced physical teaching and practical learning of music, it has transformed tutoring in some sub-Saharan African nations. In a practical approach, AI innovations have helped teachers monitor how students perform music tasks, improve learning materials and offer a collaborative learning experience (Ogada et al., 2024). Some applications within the education sector in sub-Saharan Africa, including Blackboard and Lotus Notes, ensure that teachers incorporate the experiences in the social and cultural environment into AI capacities. This results in higher learning effectiveness. With the proliferation of computers, tablets and smartphones, music students enjoy intelligent tutoring from AI agents and chatbots while receiving immediate feedback for clarification on music tasks. Yu et al. (2023) further indicated that AI systems help students and teachers manage the learning process by ensuring efficient tutoring of music content and offering music assessments.

Assisted Music Composition

AI has gained traction in assisting music compositions within and outside the classroom. Music producers use AI tools like MuseNet for music compositions for aspects such as genre and tempo (Kavinmathi, 2024). Interestingly, students can use AI to make their own songs, tuning melodies and experimenting with different music styles to learn music compositions. Although AI has challenges with copyright ownership because of using artists' voices and samples, it helps with the creative process for the music genres. It is an inspiration for music learners to generate ideas for musical creativity (Lothe, 2024). Automated lyrics composition helps learners with basic music writing. Further, AI integrated with deep learning systems generates music with a human touch by infusing technical elements with emotion-guided frameworks. With AI progress within sub-Saharan Africa, assisted composition is among the leading roles of the new technology that will help music learners with music mastery and increased efficiency in music production.

Assessment Automations

AI has eased the involvement of teachers in monitoring music students' performance. With increased digital education innovations, teachers can delegate some tasks, such as grading, to AI software as they focus on engaging learners to help them with professional development (Pillay, 2020). AI algorithms can also track music students' performance over time, offering a personalised perspective of their learning process. This helps teachers in secondary schools and tertiary institutions in sub-Saharan Africa to improve learning outcomes. Tutors adjust the learning styles and music education content to fit the learners' profile in terms of competence, assessment performance and individual preferences.

Skill Development

From a general perspective, AI is instrumental in advancing skills in the digital space. It helps with digital skills and data science analytics, while offering cost-effective methods in teaching and learning processes. Therefore, the application of artificial intelligence in music learning will progressively increase accessibility to students in the sub-Saharan region (Butcher et al., 2021). African children can also learn from AI tools that encourage the use of games as a means to enhance creativity during the learning process. AI is also applicable in natural language processing, helping music students develop creativity and improve music artistry (Mbamba, 2024). Some universities within the sub-Saharan African region are also experimenting with advanced curricula that adapt AI capabilities to enhance knowledge, skills and research outcomes.

Music learners will benefit from such progress and attain knowledge and skills in music creation and composition.

Discussion

The results of the study suggest a positive transformation of music education with the increasing adoption of artificial intelligence technology in sub-Saharan Africa. Different challenges affecting technology advancement in the African continent include: limited infrastructural resources, gender imbalances and a lower rate of internet connectivity (Butcher et al., 2021). However, the trajectory points towards increased digitisation, with preference in music education advancing towards a flipped classroom, digital music composition and personalised learning. Thus, AI tools lead towards a sustainable learning experience. Although the progress is commendable, AI is in its infancy stages, with many countries in sub-Saharan Africa lacking the pre-requisite policies that guide the implementation of a digitised education curriculum. South Africa, Rwanda and Nigeria are among the few that have copyright laws governing digital activities (Kavinmathi, 2024). The intriguing question this research attempts to answer is whether or not the AI's technological applications in sub-Saharan Africa have influenced music education. It critically examines the benefits and shortcomings of artificial intelligence in music learning, paying attention to the current opportunities and challenges.

The study's analysis shows that AI tools have been instrumental in delivering a personalised learning experience to music learners within sub-Saharan African countries. Artificial intelligence is capable of offering a simultaneous learning experience and seamless interactivity where teachers and students interact via digital platforms for teaching and learning music. The systems adapt to the learners' tempo, helping them develop music artistry, mastering lyrics, melodies and other musical styles (Luo, 2023). The digital platforms also offer real-time interactivity that helps the music students to associate with their teachers, helping them assess performance and gain useful learning guidance (Qiusi, 2022). Self-learning is also a possible prospect, offering students means of automated quizzes that boost understanding of music content. AI automation has made work easier, but its productivity depends on the degree of integration with existing music education pedagogies within the sub-Saharan region.

Music creation, composition and collaborations are vital opportunities made possible by artificial intelligence capabilities. Music educators and learners within sub-Saharan countries gain from AI tools that help with the creation of new music. For instance, AIVA generates rhythm, harmony and music styles for assisted composition (Ekpo, 2024). The AI capabilities have transformed this field by adding brainstorming ideas to the learners and making it easier to work with tools that enhance music production capabilities. AI has boosted audio quality, which helps music learners experiment with new sounds to gain more knowledge on music ensembles (Lothe, 2024).

AI has introduced intelligent tutoring and assists in skill development through education and training. Students can personalise their learning using intelligent tools and chatbots to enhance efficiency in a self-learning process (Kolog et al., 2022). They can generate queries and get immediate feedback from their computers, hence conveniently gaining knowledge and skills on different music creation styles. Artificial intelligence promotes self-discovery through music mastery, collaboration and knowledge exchange (Okorie et al., 2025). However, the challenge of accessibility to AI tools is limited within the sub-Saharan region, given the limited human resource capital, lower adoption rates and insufficient technological

infrastructure. Nevertheless, increased AI adoption led to better access to music education and efficient learning processes.

AI has indeed made significant progress in transforming music education in sub-Saharan Africa. However, the region has insufficient quality teachers to serve the ever-growing need of more schools that adopt technological teaching methods (Kolog et al., 2022). The learning experiences may also be inefficient given fewer resources to support teaching and learning. The difficulty in adapting to the new learning system and the inability to supervise educational outcomes in remote environments like home may prove challenging for an AI-guided curriculum. Moreover, schools offering AI learning infrastructure for music performance aspects in sub-Saharan Africa are limited due to the remote environment for some institutions and the late adoption of new learning systems. AI may also produce patterns of online addictions and inability of learners to independently perform tasks due to dependence on technology to conduct research and generate answers to assessments (Ogada et al., 2024). Copyright infringements on produced music content also hinder effective music learning in a digital environment. Despite the possible shortcomings, artificial intelligence will positively transform music education in sub-Saharan Africa, given the positive outcomes.

5.0 CONCLUSION AND RECOMMENDATIONS

Conclusion: This study shows that artificial intelligence is positively transforming music education in sub-Saharan Africa. AI applications have potent use in areas such as brainstorming ideas in music creation and composition, assisted learning processes, personalised music education content and practicals, automated student grading and developing skills in collaboration and knowledge exchange using AI tools. AI-enhanced music education by offering a personalised learning environment tailored to the learners' unique talents and abilities. However, challenges with the adoption of digital technologies delay the achievement of optimal benefits of using AI in music education. Sub-Saharan Africa is lagging in adoption rates, internet penetration, and teachers have insufficient training to handle the demands of AI learning. Resource constraints also play a role in deterring wide-scale adoption of digital music education. AI cannot replace physical teaching and learning of music because sub-Saharan Africa is in the developmental stages of technological adoption. The region lacks a robust policy framework for integrated curriculum development. However, with increased preparedness for a flipped music classroom and better technological investments, sub-Saharan Africa will optimally reap the benefits of implementing AI in music education.

Recommendations: Future research should focus on how governments and foreign direct or local investments in technological resources can support AI in music education. It is also imperative to establish how policy frameworks, set up by governments, institutions or stakeholders, can support the efficient use of AI in learning music.

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