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## **THE PLACE OF ARTIFICIAL INTELLIGENCE (AI) IN THE INSTRUMENTATION OF UKELE MUSIC, NDOKWA WEST LOCAL GOVERNMENT AREA, DELTA STATE.**

### **Abstract**

*Artificial Intelligence (AI) is a digital technology that interacts with humans and performs tasks based on provided data, including musical compositions. Ukele music, a traditional art form of the Ogume community, celebrates and honors community heroes who have contributed significantly to its cultural heritage. This study explores AI's role in the performance and dissemination of Ukele music, focusing on challenges to creativity and originality in traditional music. Primary data collected through oral interviews shed light on Ukele's cultural significance, while secondary sources, including books, journals, and conference papers, provide insights into AI's integration into traditional music. Findings indicate that AI has increased Ukele music's visibility both within and beyond Delta State, promoting its cultural relevance. This study recommends further AI development to foster creativity while preserving the originality of Ukele music.*

## **Introduction**

Artificial Intelligence (AI) is a digital technology that has assisted human musicians in producing music that stands the test of time. Although AI cannot completely replace musicians' natural talent, dexterity in Ukele drumming, and performance on traditional musical instruments, it poses a significant threat to the performance and preservation of indigenous musical instruments.

AI has the potential to disrupt traditional music production and composition processes, enabling the creation of music without human intervention, which could impact the livelihood of some musicians. It may also challenge notions of creativity and originality in music (medium, 2024).

Drumming instrumentation in Ukele music is highly technical, and its originality cannot be fully captured by AI due to its lack of creative ability and absence of emotional perception, which are essential for enhancing the listener's experience.

Beyond the traditions of melody, rhythm, and harmony, African music is also expressed through a rich corpus of musical instruments and instrumentations. Ezebube (2019) informs that Curt Sachs and Erich von Hornbostel, in 1933, classified African musical instruments into four families: chordophones, idiophones, aerophones, and membranophones (p. 20).

Idiophones are African musical instruments that produce sounds through the agitation of their bodies; they include xylophones, metal gongs, thumb pianos, rattles, pot drums, and slit drums. Membranophones are musical instruments that produce sound when their membranes are agitated. Ezebube's report on the classification of African musical instruments aligns with the construction elements and sound production mechanisms of Ukele musical instruments, which are classified under the idiophone and membranophone families.

Indigenous music contributes significantly to the development of the Ogume community. Ukele traditional music serves as a form of corporate communion, providing a cultural template for community experiences that bind people together as members of the same family. Ukele music is an indigenous music of the Ogume people, with its rhythm encouraging participation through singing and dancing. As soon as Ukele music is performed, the rhythm attracts the community to watch, enjoy, clap, entertain, and appreciate heroes who have brought fame to the Ogume community. The introduction of AI amplifies the rhythm to suit specific moods, making it ideal for content creators.

The Ogume community is known for its rich cultural heritage, where traditional music has been used from time immemorial to celebrate achievements, moments of joy, the ushering in of new seasons, births, and rites of passage. Agu (1990) remarks that “traditional festivals anywhere are celebrations of the continuity of culture” (p. 17). Ukele music is a cultural music used in celebrating the Ikenge festival in the Ogume community. It promotes patriotism and cultural stability, reminding the community of its roots, teaching virtues and good habits, and celebrating those who have made significant contributions to the community. Ukele music is considered the foundation of human culture and behavior in Ogume. Onuora-Oguno (2011) ascertains that “traditional music in many ways represents continuity with the past and provides insight for projection into the future” (p. 202).

Ukele music serves as a historical record for the Ogume community. Through its song texts, the audience is informed of past events and preventive measures against negative developments in their history. Ukele music is used for storytelling, with songs reflecting the past, providing a living archive of traditions, and narrating present stories. Performed annually, Ukele music fosters direct interaction with the community, reflecting its current state and educating its people through song.

Ukele is a communal music. Many scholars conceive music as a consensus of sound, melody, rhythm, and harmony, with a Greek etymology. Ipere (2002) posits that music "derives from the Greek word, muse (goddess associated with music and poetry)" (p. 42). This presents a linguistic foundation for the concept of music. However, music as a concept transcends etymology. (The American Heritage Dictionary, 2000) defines music as the "art of organizing tones that are produced into a coherent sequence of sounds intended to prompt an aesthetic response from a listener" (p. 49). While this definition limits music to its sonic state, not all music is intended to prompt an aesthetic response; however, the postulation of music as a sonic sequence highlights its acoustic dimension.

Leonard (1993) defines music as an "organization of sounds with some degree of rhythm, melody, and harmony" (p. 79). This definition underscores the importance of sound in the concept of music, though the acceptable degree of rhythm, melody, and harmony varies across cultures. The acceptability of musical components should align with a community's perception of its music.

Auditory pleasure has influenced the concept of music, as Okwilagwe (2002) defines music as "sound arranged into pleasing or interesting patterns" (p. 106). The dynamics and relativity of pleasantness in music creation and performance vary across contexts and cultures, making such definitions controversial. What may be considered pleasant in one culture may not be in another. While music can be aesthetically pleasing, it cannot be solely understood through the pleasure preferences of its listeners. Music should maintain its essence irrespective of listener preferences. To emphasize the role of humans in music-making, Blacking (1973) defines music as sound organized by humans, reflecting the human role in organizing sound to express ideas crucial to conceptualization. Okafor (2005) asserts that "the expression of ideas or emotion is vital to music because the musician must have an objective for organizing the sounds in the first place" (p. 62). In line with the foregoing, Grolier (1997) states that "music is born of emotion. Although emotion is usually expressed through music, it is also born of, and by culture; thus, it is a cultural expression" (p. 85). Aibuedefe and Abolagba (2014) note that "people's music portrays the people's culture; there is no culture that is devoid of music" (p. 100).

The duality of tradition and contemporary currents in Africa also reflects in African music. Nketia (1976) highlights "the duality of traditional and contemporary currents in Africa and how traditional arts are capable of performing critical roles in contemporary African society" (p. 13). Although Nketia's study explicates the contemporary roles of traditional culture in asserting African cultural identity within and outside the continent, particularly in post-colonial Africa, and addresses the challenges of African music, it falls short of explicitly discussing the roles of traditional music in contemporary African society as promised in the title.

### **Rhythm in Ukele Indigenous Music**

Music has long been regarded as one of humanity's most profound forms of communication and is often described as the food of the soul. Nwankpa (2012) emphasizes that "rhythm is the most prominent element in African music with its variegated complexity" (p. 9), underscoring the importance of rhythm in making indigenous music both danceable and singable. Nketia (1976) further characterizes African traditional music as being inherently rich in rhythm, often exhibiting polyrhythm, multiple rhythms occurring simultaneously and cross-rhythm, where one rhythm is played against another (p. 82). The rhythmic complexity of Ukele music distinguishes it from other indigenous musical traditions, drawing in audiences through its dynamic rhythmic interplay.

Rhythm serves as a cornerstone of indigenous music, particularly in traditional African musical performances. While rhythm is present in both vocal and instrumental forms, it is in the instrumental dimension that African rhythm truly flourishes. Nzewi (2000), in his study on the technology and music of *ogene*, highlights the significance of the *agogo*, describing it as an essential musical instrument among the Igbo people of South-Eastern Nigeria (p. 28). He notes that musical instruments in African music are not merely accompaniment but are integral to outlining and directing the basic rhythm of choreographed dance performances, reflecting the importance of rhythm in both vocal and instrumental contexts.

The influence of the *agogo* extends beyond its role in dance accompaniment. Known variably as *ogene*, *agogo*, or *ibome* (bell), this instrument is prevalent not only among the Igbo of South-Eastern Nigeria but also among the Igbo of South-South Nigeria and other ethnic groups across the country. Its influence transcends geographical boundaries, having been adopted in non-African musical contexts globally.

Collannino, Gomez, and Toussaint (2006) observe that Steve Reich's *Clapping Music* embodies a typical Yoruba bell timeline pattern. The clapped rhythm in Reich's composition consists of a static timeline that interacts with a shifting timeline, culminating in the alignment of both rhythms at a final convergence point. This exemplifies a trans-Atlantic adaptation of the *agogo* timeline. Further analysis by Collannino et al. (2009) reaffirms the Yoruba bell timeline's influence in Reich's work. Anderson and Campbell (2010) and Melizo (2016) highlight that "timelines are repeated patterns performed as components of a larger ensemble; they are steady, unchanging, and serve as temporal markers for measuring musical phrases." This steady repetition provides a structural backbone for complex musical compositions.

Toussaint's (2005) combinatorial classification and phylogenetic analysis of African timeline rhythms introduce new methods for rhythmic classification, focusing on rhythmic oddity and off-beatness. His study underscores the unique properties of the African bell pattern, which contribute to its widespread appeal. Toussaint's development of the "swap-distance" measure further aids in distinguishing between rhythms with identical stroke counts, providing a nuanced understanding of rhythmic structure. However, while Toussaint's structural analysis is insightful, it falls short of elucidating how the timeline conceptually unites African music. Agawu (2006) addresses this gap

by asserting that West African polyrhythmic dance compositions feature an ostinato bell pattern known as the timeline, characterized by its distinct timbre, asymmetric structure, and auditory prominence. His analysis not only highlights the structural intricacies of the timeline but also situates it within broader African cultural contexts, providing a holistic understanding of its significance.

The body of literature consistently affirms that rhythm is central to African music, with scholars focusing on both the structural complexity of rhythmic patterns and their interactions within African musical traditions. Ukele music, in particular, showcases a diverse array of musical instruments, each with specific nomenclature. Notably, the Ogume Ukele music ensemble employs unique terminologies for its instruments. In the Ogbe-Ogume Ukele ensemble, three membranophone drums-*kpengbu*, *edegelede*, and *di-ogwe*-form the rhythmic foundation. The ensemble also includes the *ibome* and *okanga*. The *kpengbu* articulates a four-point rhythm within a compound quadruple meter, marking the inception of each metric group. The *edegelede* complements this structure with syncopated beats, while the *di-ogwe* leads the ensemble, directing the overall musical flow. The *ibome/agogo* (bell) provides the timeline, maintaining rhythmic consistency, while the *okanga*, a pair of short, thick metal instruments, adds sharp, piercing accents at strategic intervals, enhancing the ensemble's acoustic texture.



*Ibome Instrument in ukele*



*Okangaofukelemusic*



A collection of ukele musical instruments (drums)

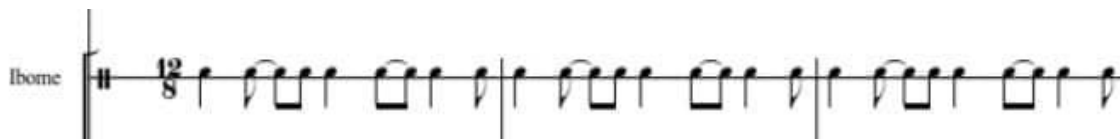
### **Drumming in Ukele Music**

A fundamental aspect of Ukele music is its drumming, which plays a central role in shaping the rhythm and overall musical experience. The drumming tradition in Ukele music consists of three drums, one gong, and a pair of metallic clappers known as *kpangba*. It is a well-established performance convention within this musical tradition to limit the number of drums to three. While the specific names of these drums may vary between different Ukele ensembles, each drum contributes a distinct rhythmic pattern to the composition. This structural consistency is evident across all the ensembles studied.

The three drums are traditionally crafted from hollowed-out wood, with one end covered by a dried and stretched antelope skin. The drumhead is secured to the wooden body using a tensioning mechanism that involves a wheel, bolts, and nuts. This setup allows for tuning adjustments, ensuring that all three drums are tuned to the tonic. Despite this uniformity in tuning, each drum performs a unique rhythmic line within the ensemble.

One of the drums articulates the four primary pulses of the compound quadruple meter, producing a rhythmic pattern of dotted crotchets across the four metric positions. Within this structure, beats one and three are played on the tonic, while beats two and four are performed on the mediant. The pitch modulation necessary to achieve these variations is accomplished by applying pressure to the drumhead with the left hand between beats, altering the tension of the drum skin and, consequently, its tonal output.

This intricate drumming framework underscores the technical precision and rhythmic complexity characteristic of Ukele music. Through the interplay of these rhythmic elements, the drumming not only provides a foundation for the musical performance but also enhances the dynamic and expressive qualities that distinguish Ukele music from other indigenous traditions.



Ibome in Ukele



Ikpemgbu in Ukele



Okubeku in Ukele



Mgba in Ukele



Amuma in Ukele

The second drum, *Okubeku*, introduces syncopation by delaying its entry with a quaver rest on beats one, two, and three of the compound quadruple meter. It further contributes to rhythmic complexity by sustaining tied quavers within these beats and concluding the meter with a minim followed by a crotchet. This drumming pattern complements the ostinato established by the first drum while simultaneously providing an additional ostinato that interacts with the initial rhythm, thereby enhancing the overall rhythmic dynamics and complexity of the performance.

The third drum, serving as the lead instrument, is played by the master drummer, whose role demands both technical expertise and extensive experience. Unlike the first two drums, the lead drum does not adhere to a strict rhythmic pattern but is instead highly improvisational, allowing the master drummer to introduce various rhythmic dimensions into the performance. The flexibility of the lead drum ensures that each Ukele performance remains unique, reflecting the skill and creative expression of the master drummer.

The significance of drumming in Ukele music tradition is evident in the perspective of the Umuchime-Ogume focus group (2022), which states:

"Okanga with ibome begins Ukele, followed by Nwautu, Kpemgbu; all these are then led by Amuma, who incepts last in that order. Thus, the names of the musical instruments are Okanga, Ibome, Nwautu, Kpemgbu, and Amuma."

This observation highlights the hierarchical structure and sequencing of Ukele drumming, emphasizing the distinct roles of each instrument in the performance.

Drumming in Ukele music is highly intensive, a characteristic noted by the Ogbe-Ogume Ukele ensemble during a focus group discussion (2022), which describes Ukele as:

"...performed through intensive drumming, a mobile orchestra that combines drumming with singing and kinetics, such as dance and demonstration. The gong incepts with the timeline, and the rest of the drums enter sequentially and continue for a while. When the drumming has stabilized, the lead singer introduces a song phrase, which is repeated twice. The vocal enforcer follows with a call, to which the chorus responds. This sequence is accompanied by mild demonstrations by non-drumming and non-singing members of the group."

This description underscores the centrality of drumming within the Ukele tradition, as it serves as the foundation upon which other musical dimensions—such as vocal performance, dance, and theatrical demonstrations—are built.

The rhythmic framework of Ukele drumming is characterized by intricate ostinati played on the three drums, regulated by the *Agogo* (gong) and guided by the African rhythmic signature known as the timeline. Although each drum's individual rhythmic line is relatively simple, their interaction results in a complex rhythmic structure that may challenge the comprehension, notation, and analysis of those unfamiliar with the tradition. Within the Ogume community, drumming remains the core of Ukele music, around which all other aspects of the tradition revolve, reinforcing its cultural significance and role as a medium of artistic and communal expression.



**Photo I: Drummers in Performance**



**Photo II: Ukele music elders in performance**

## **The Place of Artificial Intelligence (AI) in the Instrumentation of Ukele Music**

Artificial Intelligence (AI) plays a transformative role in the instrumentation and performance of Ukele music, extending beyond digital distribution into real-time musical interaction. AI-powered systems now function as intelligent collaborators, capable of generating adaptive accompaniment, analyzing expressive gestures, and responding dynamically to tempo, rhythm, and articulation during live performance.

Through real-time accompaniment models and expressive performance analysis, AI enhances tonal balance, rhythmic precision, and emotional interpretation. Smart instrument technologies embedded with machine learning can detect pitch, timing, and stylistic patterns, offering immediate feedback that refines technical accuracy and artistic nuance. This shifts AI from a promotional tool to an active component within the performer–instrument relationship.

By augmenting traditional acoustic performance with computational responsiveness, AI expands the expressive range of Ukele music while preserving its cultural identity. Rather than replacing human artistry, AI strengthens instrumentation practice by enabling interactive collaboration, enhanced precision, and deeper emotional communication in contemporary performance contexts.

AI's incorporation into Ukele music has strengthened both its artistic depth and its global presence. Through AI-assisted mixing and mastering technologies, Ukele instrumentalists can enhance tonal balance and clarity, ensuring their performances resonate with international audiences. Algorithm-driven streaming services and digital distribution platforms have amplified Ukele music's visibility, generating new financial opportunities through streaming income, online sales, and social media engagement. Beyond production and distribution, AI analytics provide musicians with feedback on rhythmic patterns and compositional structure, encouraging artistic growth. The widespread availability of digitally recorded Ukele performances also cultivates a shared listening community, deepening emotional bonds between audiences and the cultural festivals associated with Ukele music.

The integration of AI into Ukele music has also contributed to its increased popularity beyond Delta State, where it originates. AI-powered social media algorithms and streaming services have played a crucial role in amplifying Ukele music, often resulting in viral trends that attract a

diverse audience. Traditionally, Ukele music is performed to honor community heroes, but AI has expanded this tradition by enabling audiences from different regions to partake in celebrations remotely. This digital exposure has encouraged fans to explore the music's cultural significance while also influencing their mental well-being, physical health, and overall lifestyle. Additionally, Ukele instrumentalists have come to recognize AI's role in fostering relationships and providing encouragement, particularly in difficult times.

Beyond its role in distribution and engagement, AI has inspired Ukele instrumentalists to refine their skills and explore new techniques in playing traditional instruments such as the *Kpemgbu* (drum), *Edegelede* (drum), *Amuma* (drum), *Okanga* (flute), and *Ibume* (slit wooden drum). The fusion of these traditional instruments with AI-driven mixing and mastering tools has further enhanced the quality of Ukele music, ensuring its patronage across different generations. A defining feature of AI, as seen in other digital platforms, is its algorithmic foundation, which allows intelligent machines to analyze Ukele rhythms and tailor them to listeners' preferences, thereby enhancing audience engagement.

### **Advantages of Artificial Intelligence (AI) in Ukele Music**

Each technological advancement presents both advantages and disadvantages. AI has introduced new dimensions to Ukele music, including improved originality and accessibility. By digitizing Ukele performances, AI ensures that the music is preserved in its original form and can be experienced both within and outside the community, thereby promoting cultural sustainability.

AI has also contributed to employment growth within the Ukele music scene. The increasing visibility of Ukele performances attracts more individuals from the community, expanding the number of participants in the music tradition. Revenue generated from digital music sales, festival performances, and other AI-facilitated opportunities is distributed among members, improving their livelihoods. Additionally, AI mitigates the decline in traditional musicianship by fostering intergenerational skill transfer. Younger members of the community take over from older musicians, demonstrating dexterity in instrument performance and even engaging in the production of traditional instruments using locally sourced materials.

### **Disadvantages of Artificial Intelligence (AI) in the Instrumentation of Ukele Music**

Despite its benefits, AI also presents challenges that threaten the authenticity of Ukele music. The instrumentalists are the heartbeat of the Ukele music tradition, and the annual Ukele festival serves to honor both male and female members of the Ogume community who have contributed to its cultural heritage. However, AI's influence risks altering this tradition.

According to *Medium* (2024),

“Artificial intelligence (AI) has the potential to disrupt traditional music production and composition processes, enabling the creation of music without human intervention, which could impact the livelihood of some musicians. It may also challenge notions of creativity and originality in music.”

This assertion highlights a key concern: AI lacks creative autonomy and relies on pre-existing human compositions. Since AI-generated music is based on data inputs, it cannot independently produce truly original Ukele music. Instead, it reproduces the information it has been fed, thereby diminishing the role of traditional instrumentalists in shaping the music's originality.

AI has also led to increased unemployment among Ukele musicians. In the past, traditional Ukele performances were integral to community gatherings, with instrumentalists physically present to provide live music. However, in the 21st century, AI-driven technologies, including digital DJs and automated music software, have begun replacing live instrumentalists at festivals and events. Recent studies on real-time AI accompaniment systems demonstrate that machine-learning models can now generate harmonic backing, rhythm layers, and even stylistically adaptive improvisations during live events (Kritsis et al., 2021; Zhang, 2025). Event organizers increasingly adopt such systems because they reduce costs associated with hiring multiple instrumentalists. In practical terms, a single performer equipped with AI accompaniment software can replace an entire ensemble. This technological substitution reduces paid performance opportunities for traditional Ukele instrumentalists, particularly younger musicians who depend on festival engagements and ceremonies for income.

Furthermore, streaming-based consumption models often generate minimal revenue per play, concentrating earnings on digital intermediaries rather than local performers (Mycka & Mańdziuk, 2025). Thus, while AI broadens reach, it may simultaneously weaken the economic sustainability of community-based musicianship.

Additionally, the reliance on AI in Ukele music has contributed to a decline in traditional skills acquisition. Agu (2009) defines folk music as “the traditional music of the people that moves from one generation to another, with the original composer often unknown” (p. 18).

Historically, Ukele music instrumentation has been passed down through generations, ensuring its continuity. Younger community members typically learn from elder musicians, sometimes serving as apprentices to master instrumentalists. However, AI has altered this dynamic by reducing interest in hands-on learning. Many members of the Ogume community now prefer listening to recorded Ukele music online rather than actively engaging in its performance. Research on AI-assisted music learning tools shows that while real-time feedback applications improve short-term accuracy, they may also encourage dependence on automated correction rather than deep internalization of technique (Ou et al., 2025). When learners rely heavily on AI-generated accompaniment or auto-correction features, they may not fully develop rhythmic intuition, improvisational skill, or ensemble sensitivity, qualities traditionally cultivated through face-to-face mentorship.

Moreover, computational expressive models can simulate stylistic ornamentation and phrasing (Bontempi et al., 2023), potentially reducing the motivation for apprentices to master these techniques manually. Over time, this may result in “deskilling,” where musicians become operators of AI systems rather than bearers of embodied cultural knowledge.

This shift has contributed to a decline in musical skill acquisition, fostering complacency and reducing motivation to preserve traditional Ukele instrumentation.

Another significant drawback of AI in Ukele music is the absence of emotional depth. Music is deeply tied to human emotions, and Ukele music, in particular, holds profound cultural and sentimental value for the Ogume people. Traditional performances evoke strong emotional responses, fostering unity, love, peaceful coexistence, and communal joy. The inability of AI to replicate these deep emotional connections weakens the cultural impact of Ukele music.

Shakespeare (cited in Okafor & Okafor, 2009, p. 9) states,

The man that has no music in himself or is not moved with the concord of sweet sounds is fit for treasons, stratagems, and spoils; the motions of his spirit are dull as the night and his affections as dark as Erebus, let no such man be trusted. (p. 9).

This statement underscores the indispensable role of emotional engagement in music. The Ogume people hold Ukele music dearly as a cultural expression of their identity, and they remain committed to its preservation. However, the proliferation of AI-generated music challenges this commitment by reducing the community's direct involvement in live performances, thereby threatening the sustainability of the tradition.

Furthermore, the norms and values of the Ogume community are at risk due to AI's influence. The introduction of AI into Ukele music has inadvertently shifted the cultural landscape, with some community members prioritizing digital convenience over traditional engagement. This shift presents challenges in maintaining the authenticity and vibrancy of Ukele music, necessitating a balanced approach to AI integration to safeguard the music's cultural integrity.

## **Conclusion**

While AI has played a significant role in enhancing the performance and dissemination of Ukele music, it cannot fully replicate the creativity, dexterity, and emotional depth of human musicians. AI has expanded the reach of Ukele music beyond the Ogume community, yet its influence risks altering the authenticity of the music. To preserve the cultural integrity of Ukele music, AI should support, rather than replace, traditional performance, ensuring that the emotional and cultural values inherent in the music are maintained.

## **Recommendations**

AI technology should be further developed to exhibit a greater degree of creativity, ensuring that its role in Ukele music aligns with the music's original structure and artistic integrity. AI should aim to support, rather than replace, human musicians.

The performance of Ukele music should incorporate additional instruments beyond the existing ones to create richer musical textures. Additionally, performances should be restricted to designated cultural occasions to maintain the sacred and traditional significance of Ukele music.

The emotional depth, cultural norms, and values of the Ogume community should be integrated into AI-assisted Ukele music performances. This will ensure that AI-enhanced music remains culturally authentic and retains the emotional essence that defines Ukele music.

To prevent over-reliance on AI, the community should continue prioritizing human-led production and performance of Ukele musical instruments. Encouraging active participation in instrumental craftsmanship and performance will mitigate the risk of declining interest and potential laziness among younger generations.

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