



ILLUMINATING CONTEMPORARY CHOREOGRAPHY: THE ROLE OF
LIGHT DESIGN TECHNOLOGY IN DANCE CREATION AND
PERFORMANCE IN BOLANLE AUSTEN PETERS' MOREMI THE
MUSICAL

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Abstract

Background. Lighting in dance once served one job: to make the stage visible to the audience. Programmable fixtures, digital control systems and projection infrastructure have changed this, and light now works as a means of composition rather than a service to vision. The change reflects a wider movement of digital technology into live performance. **Objective.** This study examines light design technology as a constitutive element of contemporary dance and argues for its part in choreographic composition, narrative construction and affective communication. **Methodology.** The research combines theoretical synthesis with textual analysis of one production, Bolanle Austen-Peters' *Moremi the Musical*, staged at Terra Kulture in Lagos. Frameworks from performance studies, colour psychology, symbolic interactionism and human-technology interaction inform a four-stage reading of the publicly available recording, organised around chromatic coding, perception of space and time, performer-technology relations and audience response. Each observation is anchored to a recording timestamp for independent verification. **Results.** LED systems, intelligent consoles, projection mapping and AI-assisted virtual environments widen the choreographic palette, order perception and carry emotion and story without words. The production holds to an internally coherent chromatic system rooted in Yoruba performance aesthetics, distinguishing it from comparable Western stagings. **Conclusion.** Light design technology serves as a principal compositional language in contemporary dance. The study calls for sustained interdisciplinary research on access, durability and algorithmic accountability within AI-assisted practice, so the form remains open to practitioners working beyond well-resourced production settings.

Keywords: *light design technology; choreographic composition; projection mapping; performance studies; Yoruba theatre; human-technology interaction*

ILLUMINER LA CHORÉGRAPHIE CONTEMPORAINE : RÔLE DE LA CONCEPTION LUMINEUSE DANS LA CRÉATION ET LA PERFORMANCE DANS LA DANSE DANS *MOREMI THE MUSICAL* DE BOLANLE AUSTEN PETERS

Résumé

Contexte. L'éclairage dans la danse remplissait autrefois une seule fonction : rendre la scène visible au public. Les projecteurs programmables, les systèmes de commande numérique et les infrastructures de projection ont transformé cette situation, et la lumière agit désormais comme un moyen de composition plutôt que comme un service rendu à la vision. Ce changement traduit une entrée plus large du numérique dans la performance vivante. **Objectif.** Cette étude examine la technologie de conception lumineuse en tant qu'élément constitutif de la danse contemporaine et soutient son rôle dans la composition chorégraphique, la construction narrative et la communication affective. **Méthodologie.** La recherche associe une synthèse théorique à l'analyse textuelle d'une production, *Moremi the Musical* de Bolanle Austen-Peters, présentée à Terra Kulture, à Lagos. Des cadres issus des études de la performance, de la psychologie des couleurs et de l'interaction humain-technologie guident une lecture de l'enregistrement disponible au public, organisée autour du codage chromatique, de la perception, des relations entre interprète et technologie et de la réponse du public. **Résultats.** Les systèmes LED, les consoles intelligentes, le mappage par projection et les environnements virtuels assistés par intelligence artificielle élargissent la palette chorégraphique, ordonnent la perception et portent l'émotion et le récit sans mots. La production maintient un système chromatique cohérent ancré dans l'esthétique yoruba. **Conclusion.** La technologie de conception lumineuse sert de langage compositionnel principal dans la danse contemporaine. L'étude appelle à une recherche interdisciplinaire soutenue sur l'accès, la durabilité et la responsabilité algorithmique.

Mots-clés : *technologie de conception lumineuse ; composition chorégraphique ; mappage par projection ; études de la performance ; théâtre yoruba ; interaction humain-technologie*

Introduction

Dance is an important form of human expression in the field of performance studies, influenced by changing art and technological usage. In the past, lighting in dance was primarily used to light the stage so that the audience could see what was happening. The advent of complex light design techniques has extended this role dramatically, as light is now an active and integral component of choreographic concepts and their subsequent interpretations, used to evoke emotion and to affect the space and its use (Basa, 2023; Badeji, 2022). It is a paradigm shift from the past, when lighting was often used as a secondary element in dance, to its current status as a primary element in dance-making and performance. This shift in the relationship and other trends in artistic practice result from the emergence of digital control systems, programmable fixtures, and projection infrastructure.

The use of technology in dance is not new, but the rate and extent of its use have grown considerably in the early decades of the twenty-first century. In particular, contemporary dance has embraced technological innovations that have expanded the limits of the dance's formal language. Izuta et al. (2019) share experiences showing that new technologies, such as Light Emitting Diode (LED) costumes, wearable sensors, interactive lighting systems, projection mapping and virtual stage lighting, are no longer used as additional embellishments but are becoming integral parts of the production process. These technologies enable choreographers and designers to control colour, intensity, movement and texture in detail, and, directly, to

influence the audience's perception and emotional response (Basa, 2023). What is important about the shift analytically is the extent to which light has become an agent in the choreographic process, not simply a means to see, but a choreographic partner.

The use of light-designed technology in dance is increasingly popular, but there is a lack of literature that delves into the contribution of light to creation and performance (Xiong, 2025). There is a lack of studies that bring together various technologies and their contextual applications, and provide a synthesised output explaining the overall impact of light design technology on the dance system. This study attempts to fill that void by exploring light design technology as a choreographic tool, an emotional instrument, and a spatial architect in the choreographic art of contemporary dance, using a major theatrical production in Nigeria. It is based on recent academic research from the fields of performance studies, lighting design, psychology and human-technology interaction and combines theoretical approaches with textual analysis of a particular large-scale performance.

There are a number of fields and locations where scholarship on light design for dance can be found. The expressive and spatial role of light in theatre and dance has generally been studied as a whole (Mumford, 1985; Birringer, 2004; Basa, 2023). There are studies of LED costumes and wearable lights in engineering and design (Izuta et al., 2019), and of projection mapping and interactive systems in choreography within digital performance scholarship (Birringer, 2004). There is a relative lack of research on the integration of these technological elements into theatre in Africa, particularly in large-scale musical productions rooted in the Yoruba world. While not claiming to have ignored the work that has been done, this study positions itself as a systematic analysis of the workings of light design technology as a whole, treating it as a compositional language within a specific and underrepresented production context.

This study explores how light design technology can become a transformative tool in the creation and performance of dance. In particular, it explores how different lighting design technologies are used to extend artistic potential, shape the emotional narrative, and reshape the interaction between performers, the stage, and the audience. The case study is *Moremi the Musical*, presented at Terra Kulture in Lagos by Bolanle Austen-Peters. This production was chosen because it utilised an array of cutting-edge lighting technologies within an extended dramatic framework rooted in Yoruba cultural tradition, thus providing a fruitful platform for discussion of the technical and dramaturgical aspects of light design in an African performance context. Badeji (2022) has previously analysed the communication aesthetics of techno-scenery and lighting in this production; this study further extends and broadens that analysis into a broader theoretical and technological scope.

Methodology

For the purposes of this case study, *Moremi the Musical* was chosen for three reasons. Secondly, the production makes unusually dense and varied use of lighting design technologies in a single performance, from LED wash systems and intelligent moving-head fixtures to digital projection mapping, moving (programmable) colour fields, and embedded subtitle projection; it becomes an analytically rich environment to explore various technological modalities at once. Secondly, the concept of dramaturgical foundation in Yoruba oral tradition and cosmology adds an African background to the performance, allowing the semiotic roles of colour and light to be manifested with culturally specific meanings that go beyond what is commonly found in the theatre of the West, thereby broadening the scope of the analysis. Third, the production has been partially analysed in prior scholarship by one of the authors (Badeji, 2022), and the present

study builds on these studies. The main source of AV data is the publicly available production recording uploaded to YouTube by Bolanle Austen Peters Productions (<https://youtu.be/h24s15DyjC0>). The times referred to in the analysis are the running times of this recording and allow the reader to find and read each observation for themselves.

A systematic search of peer-reviewed databases was used to select literature. The search terms shifted among the following: 'lighting design', 'choreography', 'performance technology', 'projection mapping', 'LED costume', 'interactive lighting', and 'human-technology interaction in performance'. The selection of articles was based on the following inclusion criteria: (1) the articles are peer-reviewed journal publications or chapter publications from edited sources or doctoral theses published between 1980 and 2026; (2) the articles focus on light design, performance technology or related choreographic practice, the clearance of which was confirmed by the editor. Sources that included only lighting in non-performance architectural or film settings, or were grey literature (no scholarly association), were not included. The fact that the research team was limited to conducting the research in the English language led to the non-systematic inclusion of non-English sources, which is an acknowledged limitation.

There were four stages of processing the performance footage. The entire recording was seen three times in the first stage to gain an overall sense of how the production has been lit and to flag up any periods of interesting lighting intervention. The second phase involved identifying the various scenes and comparing the content with the four analytical categories that were pre-established: chromatic coding and emotional function, space and time processing, relationship between performer and technology, and mechanisms of audience interaction. In the third stage, specific times were recorded and noted for each category and lighting was described by colour temperature, intensity, direction and movement. The fifth stage involved an analysis of the correspondence between the observed practice and theoretical framework developed from the literature in order to evaluate the extent of similarity between what is happening and the scholarly characterisations of the functions of light in performance. The categories used in this analysis were inductively developed as the footage was examined and patterns not originally expected by the analysis framework were identified.

The epistemological challenges caused by the authors' prior knowledge of the production and its institutional setting are discussed in the study. One of the authors is professionally and culturally acquainted with the Yoruba performance traditions, and Badeji (2022) has previously published on *Moremi the Musical*. In order to avoid epistemological conflation, the analysis is based on Bachelard's (1938) idea of the "epistemological break": previous knowledge is considered as a possible source of distortion for the objective observation and is therefore treated with critical distance, that is, from the systematic application of the analytical framework developed from the literature and not from the objective observer's personal experience (Simons, 2018). All observations are supported by references to the times in the film, so that they are capable of being checked independently. The study does not aim to be exhaustive or definitive, but rather it is a theoretically informed and methodologically clear interpretation of the acquired audiovisual data.

Results

The findings of the study are presented under the four analytical tasks. In Section 3.1, the psychological functions of light are explored, which form the chromatic and affective logic in the design of the production. Section 3.2 explores the key light design technologies used in the production such as LED systems, wearable light costumes, projection mapping, and AI-driven virtual environments. In section 3.3, the influence of these technologies on the creation

of dance is explored, with a focus on the potential for choreography and story creation. The third section (3.4) focuses on the effect of the technology on performance, exploring aspects of audience engagement, performer-technology interaction and technical problems with large-scale production. The organisation of the sections follows a logic that shifts between theory and technic, and then onto creativity and performance, mimicking the flow of the study from design principles to their consequences for the dramatic practice.

1 The Psychology of Light in Performance (10m)

The psychology of perception records the effects of light upon the emotions of its beholders. Lighting designers appeal to the subconscious to evoke emotional reactions in the audience through specific colour, intensity and movement patterns. Research shows that lighting consistently can produce happiness, sadness, tension and relaxation; high-key lighting produces feelings of joy and happiness, and low-key lighting creates feelings of mystery or dramatic weight (Poland, 2015). The colour temperature of light works on a similar principle: warm colours like red and yellow are associated with energy and passion, while cool colours like blue and green are associated with tranquillity or melancholy (Shehds, 2025). In dance, these psychological effects are enhanced by the interplay of light and movement, creating a multisensory experience in which they interact with the audience's emotional state.

The study of *Moremi the Musical* shows these principles in the context of Nigerian theatre. The lighting design is a key compelling element, using a clear colour palette to provoke different moods in separate scenes within the production. The main lighting options used and the psychological functions they serve are presented in Table 1, which also shows their use in the performance.

Table 1: Chromatic Coding and Psychological Function in *Moremi the Musical*

Lighting Element	Psychological Function	Performance Instance
Purple and deep blue	Mysticism, royalty, and the supernatural	Underwater sequences (05:16-06:16) construct a calm yet alien environment, signifying the spiritual realm of the river goddess
Intense red	Conflict, danger, and ritual intensity	During the Igbo raids (01:00, 06:17), the stage is bathed in red, heightening the audience's sense of urgency and physical threat
Gold and warm white	Divinity, hope, and moral authority	Moremi's appearances in golden attire (00:45, 11:15) are framed by bright spotlights that isolate her as a figure of purity and spiritual authority

Source: Authors, based on analysis of Bolanle Austen Peters' Moremi the Musical (2026)

Light is added to these chromatic methods. The tempo is increased and the excitement created during high-energy dance sequences in *Moremi the Musical* with the use of a quick shift of the spotlight and flashing coloured lights (01:05 and 06:58). Luminous rhythm's alignment to corporeal rhythm exemplifies the principle suggested by Poland (2015) of active participation of light in structuring the audience's sensory and affective engagement. The lighting design is used as a semiotic system throughout this production, always implying meaning in relation to a given character, narrative phase and emotional register.

Figure 1: A spotlight or coloured lights flashing their beams during a dance scene with high energy



Source : Screenshot from <https://youtu.be/h24s15DyjC0>

2 Light Design Technologies in Dance.

2.1 Traditional and Modern Lighting Techniques

Traditionally, stage lighting was done with fixtures like spotlights, floodlights and cyclorama lights, switched on by hand or via simple dimmer boards. The techniques were limited in their flexibility for colour modulation, programmatic movement and complex cueing (Basa, 2023). The digital lighting control system, smart fixtures and LED technology are used in modern lighting practice to create dynamic and layered effects. Digital consoles enable precise programming of light cues, creating seamless transitions, patterns and synchronised movement between choreographic sequences. The energy efficiency, longevity, and range of colours of LED technology is very important, as LEDs produce a wide range of colours, and the intensity can be rapidly modulated, without the use of physical gels like those used with incandescent lights (Fan et al., 2019). Mumford (1985) outlines the history of lighting design, from primitive theatrical lighting to the fully integrated lighting design system that emerged in the mid-twentieth century.

In *Moremi the Musical*, these contemporary features are used to great effect. Digital console transitions allow for a smooth shift from the opening sequence (00:10) to the realistic setting (01:20) in the Yoruba village. The digital console enables a seamless shift from the opening sequence (00:10) to the Yoruba village (01:20), creating a rapid transition between registers. The LEDs used in this project enable fast modulation of light intensity and colour, which would be impossible with traditional incandescent technology. This shift from static, manually operated systems to dynamically controlled, digitally operated systems has significantly expanded the form's aesthetic possibilities. In the context of the lighting system in *Moremi the Musical*, Badeji (2022) shows that the system operates within an internally coherent chromatic aesthetic rooted in Yoruba performance aesthetics, differentiating it from similarly lit productions in the West.

Figure 2: showing a realistic Yoruba village setting



Source : Screenshot from <https://youtu.be/h24s15DyjC0>

2.2 LED Costumes and Wearable Technology

Wearable technology, such as LED costumes, represents a massive breakthrough in lighting science and occurs within the performer's body. The use of LED costumes in large-scale concerts and dance performances is reported, and design guidelines are presented by Izuta et al. (2019). These costumes are not simply ornamental – they become a mobile source of light, allowing dynamic visual patterns that interact directly with movement. By controlling when and what colour LEDs are used in the costume, costumes can be incorporated into the overall light design, with the body as a fabric within the fabric. Other wearable technologies, such as E-Ink and Electroluminescent wire, have also opened additional possibilities, as exemplified by Light Balance (Izuta et al., 2019).

With *Moremi the Musical*, the concept of the performer as part of the lighting scheme is realised through costume interaction with the spotlights rather than through dedicated wearable electronics. The golden costume that Moremi wears (11:15) utilises the costume to enhance the stage lighting, making it part of the scene's visual composition. Throughout the production, the sharp spotlights follow her, creating a “refracting” surface on the costume and thus strengthening her status as a divine narrator. This interaction breaks down the traditional division between costume design, lighting design and choreographic composition, creating a “fully integrated” visual performance in which human figures are co-constituted with the luminous environment.

Figure 3: *Moremi's* golden costume lit up with stage lighting



Source : Screenshot from <https://youtu.be/h24s15DyjC0>

2.3 Interactive Lighting and Projection Mapping

Interactive light systems are designed to respond to dancers' movements, sounds or other stimuli in their environment, creating a responsive experience. Usually, the systems use motion sensors or depth cameras to monitor the performer's real-time movements and respond by exhibiting light within the visual environment as a dialogue with the dancer (Birringer, 2004). Projection mapping enables the display of imagery or video on stage surfaces, stage sets and sometimes performers, creating elaborate and dynamic visual environments. The image is precisely mapped onto the moving targets, and both the image and the targets move in harmony through the combined use of projection mapping and human tracking technologies. The creative potential of this approach is considerable, but it has limitations in ensuring accuracy and in the need for high-intensity projection facilities.

Moremi the Musical is a musical heavily dependent on projection mapping to create narrative spaces. Using projections, the production shifts from the colourful underwater world (07:40) to a void with the power of the heavens. Projections allow the production to cross representational boundaries that the physical stage space alone would not support. The menacing face with glowing red eyes (04:25) is a constant psychological reminder of the sworn enemies of the Igbo people, something that physical scenography alone could not have created with the same level of economy of means. The whole thing of subtitles being projected directly onto the scenic surfaces (03:05) is also one more way in which the production has evolved into a technical necessity into something that has been designed as a visual element, as another mode of language mediation, as part of the aesthetic logic of the performance.

2.4 Virtual Stage Lighting & AI in Choreography

Virtual stage lighting with 3D environments allows choreographers and designers to test lighting ideas before implementing them in reality. Xiong (2025) sees the potential of this technology in dance production and as an active component of choreographic composition. By controlling colour, rhythm, intensity and trajectory in a virtual environment, the designers can create a narrative atmosphere and spatial perception before investing in live production. Xiong (2025) views participatory creation with virtual lighting as a technology that facilitates creative production, rather than as an added tool.

The incorporation of Artificial Intelligence (AI) into choreography is a step in this evolution. In the paper “Generative AI as a Co-creative Partner: Generating Movement Sequences and Lighting Cues from Real-time or Preset Parameters,” Reis et al. (2025) illustrate the use of generative AI models as co-creative partners to generate movement sequences and lighting cues based on real-time or predefined parameters. The influence of AI on choreography raises questions about human-AI collaboration and the role of the human artist in a technology-infused creative process. AI as a choreographic partner brings into question notions of authorship and creativity, and introduces new explorations of how humans and AI can work together creatively. The overall design coordination for *Moremi the Musical*, as well as the light and projection, is not explicitly using AI, but it is using the systematic coordination of light, projection and movement as a gauge of the level of rigour with which the design is being coordinated, which is what AI-assisted pre-production is supposed to facilitate.

3 Impact on Dance Creation

3.1 Enhancing Choreographic Possibilities

Advanced light design technologies have helped to materially expand the choreographic field and the possibility of creating movements and stage compositions which were previously limited by the physical and technical capacity of traditional production. New technologies add dynamic, responsive features that can be integrated at the compositional level and responded to with movement. The interactive lighting systems that are responsive to the presence, speed or gesture of the dancer offer opportunities for improvising and generating choreography. Birringer (2004) shows how such spaces create a kind of dynamic relationship between the performer and the illuminated environment, generating emergent and co-created choreographic moments, both human and technological. It is in a virtual space that experimentation with virtual stage lighting and AI in choreography become productive, such as three-dimensional virtual environments used to visualise and test lighting schemes and their choreographic implications prior to production, as reported by Xiong (2025), and the use of AI algorithms to generate ideas for movement that are then picked up by human dancers and embodied, as described by Reis et al. (2025).

The way light is used in the choreography of *Moremi the Musical* demonstrates these elements. Tight spotlights (03:10) establish a psychological connection between soloist and listener, and broad chromatic washes of greens, yellows and blues establish the 'space' of ensemble movement and make collective choreography appear at a scale that the physical stage would not sustain. When light is moved in the high-energy sequences (01:05, 06:58), it is synchronised with the dance and is not just an accompaniment but also a part of the compositional process that influences the perceived energy and rhythm of the dance.

Figure 5: Tight spotlights make an intimate psychological connection between the soloist (Moremi) and the audience



Source : Screenshot from <https://youtu.be/h24s15DyjC0>

3.2 Narrative and Emotional Storytelling

Light design technology is an integral part of the narrative and emotional aspects of dance. Light can tell a story, affect the mood, and inspire emotional reactions to the show; it can reveal more than just being a source of illumination. Basa (2023) suggests that lighting design is a visual rhetoric in its choice of colour, intensity and texture. Projection mapping plays a key role in this storytelling capability, taking the audience from one space to another, showing abstract notions and creating visual meanings that enrich the dramatic context. Other colours, like warm (reds, oranges, yellows) and cool (blues, greens, purples), evoke feelings of excitement or passion – or of tranquillity, melancholy or the uncanny.

Along the Sacrifice Arc, the primary narration tool of *Moremi the Musical* is light. The lighting design also shifts from the chaotic, multi-coloured flash of the war scenes to the subdued, low-intensity blues and purples in Moremi's sacrifice (08:15), drawing the audience's attention to the scene and creating a kind of quiet reflection that would not be achieved as effectively by the choreography alone. Light also serves as a temporal indicator here, as the warm colour of the village council scene is contrasted with the cool colour of the river ritual, without the support of verbal narration or set changes that would otherwise provide a telling sense of the passage of time and of the shift between social and spiritual registers. This function is consistent with Badeji's (2022) argument that lighting in the production becomes a major semiotic means by which the Yoruba cosmological difference between the mundane and the divine becomes legible to a culturally mixed audience.

Figure 6: The change in lighting from a colourful and chaotic war scene to low intensity blues and purples for Moremi's sacrifice.



Source : Screenshot from <https://youtu.be/h24s15DyjC0>

3.3 Spatial and Temporal Manipulation

There is significant potential for the use of light in dance to manipulate space and time in the performance. When solid scenery is limited or nonexistent, a shaft of light becomes the equivalent of a 3-D form: it can create walls and linear structures, change background and floor colours and dynamically redefine the functional areas of a stage, Basa (2023) notes. Directed lights highlight individual performers and create a sense of enclosure, while wide washes release the stage to suggest scale and freedom.

Consistently used in *Moremi the Musical*. The visual architecture of the production is defined by dark voids and graduated light fields that create a multiplicity of spaces, a small physical stage, the depth of a river, and the immensity of the night sky, all of which can be present in a single performance. The projected environment of the 07:40 sequence gives rise to a vibrant underwater world, created without any material scenic infrastructure. Lighting changes are also key in this film, given that the nightly raids by the Igbo happen fast (01:00, 06:17) and create a compression of time, but the gradual fades, which come with Moremi's sacrifice (08:15), slow down the perceived time and add weight to the film's emotions. The overarching shift from dark and oppressive colours to a colourful, sunny conclusion at the end of the sequence (10:20) serves as narrative closure that "carries the sense of instant, feeling accessibility" (Xiong, 2025) and communicates the reestablishment of communal peace in an affectively present and structurally legible manner.

4 Impact on Dance Performance

4.1 Audience Engagement and Immersion

An important role of high-tech lighting design is to enhance audience engagement and create experiential intensity. Old-fashioned stages were lit to clearly distinguish the stage from the audience. In the era of modern light technologies, this boundary is actively dissolved, and the spectators are invited into the performance and into a closer connection to the art form that this technology provides. As Basa (2023) notes, the use of light to create moods can directly impact an audience's emotional arc through a performance. Interactive lighting systems are especially suited in this respect, as they respond to the choreographer's movement or musical

structures, creating a visual space in which the audience participates in a sense of co-presence with the choreography.

This is always performed in *Moremi the Musical*. The gradual increase in light in the last few moments shifts from a dark and oppressive to a bright, multi-coloured ending (10:20), which encodes the restoration of communal peace and the victory of the story's protagonist, both of which are communicated without verbal/linguistic mediation and without textual mediation. The projection mapping effect also makes a big contribution to the production: the stage is transformed into a lively seascape (07:40) that creates a multi-layered illusion of reality for the audience, beyond the auditorium walls.

4.2 Performer-Technology Interaction

Previously, the role of the performer and light design technology was passively performed, with the dancers moving around within the illuminated space, but it has now evolved into an active, and sometimes symbiotic, co-creative process. Costumes made with LEDs and wearable technologies are examples of this; as Izuta et al. (2019) report, the dancer's body becomes a light source radiating patterns integral to the choreographic structure. Interactive lighting systems further enhance these interactions: the dancer's speed, orientation, or hand movement can influence the visual field in various ways, and the resulting changes in the visual field can, in turn, influence the dancer's speed, position, and hand movement, and so on (Birringer, 2004).

This is evident throughout *Moremi the Musical*, where the symbiotic relationship between the performer and the visual environment is clearly present. The silhouettes and shadow play in the production are sharp, emphasising the formal aspect of the dancers' bodies, and space awareness is a key factor in the performances. The tracking spotlights on the narrative track *Moremi*, making her presence even more physical and her movement the visual centre of the production. Virtual stage lighting and intelligent systems that generate choreographic prompts put dancers in new roles, such as being interpreters of an intelligent system, as shown by Reis et al. (2025); and also stimulate new movement responses, as described by Xiong (2025).

4.3 Technical Challenges and their management

Adopting advanced lighting design technology in the dance arts is a significant technical challenge. One of the main challenges is the synchronisation of multiple technological elements such as LED fixtures, projection systems, wearable devices, sensors and control software, which must work in perfect sync. Any delay in the performance of the light effect in response to a dancer's movement will break the flow of the performance and compromise artistic integrity. The solutions are generally based on a high-performance network infrastructure, a specialised control protocol such as DMX (Digital Multiple X) or Art-Net, and a sophisticated programming environment for accurate timing and sequencing (Izuta et al., 2019). As highlighted by Youth For SDG (2024), the inability to achieve accuracy and precision is an ever-present issue with any technology in use, regardless of which requires systems to be reliable enough to meet the challenges of live production.

The technical system and rehearsal structure of *Moremi the Musical* overcomes these obstacles. The synchronisation of projection mapping, embedded subtitles and the live performance throughout the entire production is a level of system reliability which complex light cueing requires. An example of the direct incorporation of English subtitles into the scenery (03:05) shows a technical and potentially distracting element that becomes a narrative

tool with aesthetic value. Compared to non-interactive/inactive systems, wearable and interactive systems also need to be durable and ergonomic in relation to human use, and the cost of acquiring and maintaining these systems is also a challenge, especially outside of well-resourced institutional environments (Izuta et al., 2019; Badeji & Omotunwase, 2026). Badeji and Omotunwase (2026) cite similar infrastructural challenges in the integration of augmented reality in theatre practice in Nigeria, specifically an unreliable power supply, the cost of capital and a lack of specialist technical training.

Discussion

The results of this study support the primary argument that light design is no longer a secondary element of the dance production, but a key compositional element in modern dance today. The evidence gleaned from the literature and the analysis of *Moremi the Musical* follows a clear path: light technology alters the aesthetic, narrative and interactive aspects of the dance work at every level of its production and in its performance process. This path is echoed in current research on human-tech interaction in the performing arts, which has found that a defining attribute of the current technologically mediated performing context is the transition from 'tool use' to 'co-creation' (Reis et al., 2025; Birringer, 2004). In the particular context of the Nigerian theatrical production, Badeji (2022) also confirms that this compositional logic is not merely borrowed from the Western tradition but is adapted and localised in the Nigerian tradition using an indigenous aesthetic framework that involves the use of colour, light and spatial arrangement as systems of meaning that are culturally specific.

The transformation from basic lighting hardware to systems that are assisted by AI is a significant paradigm shift in the art world. Basa (2023) describes this shift as a move from the decorative element to scenic art with a strong emotional impact. The analysis of this musical, *Moremi*, will support this characterisation, as will the analysis of the text and light, which in this work are not merely a means to an end, but one of its main compositional elements. The use of colour as a consistent semiotic system in the production, with the deep blue shifting to the spiritual realm (05:16-06:16), intense red as a sign of conflict (01:00, 06:17), and gold as a code for divine authority (00:45, 11:15), shows the extent to which lighting design can serve as a structured language rather than an atmospheric effect. This result corresponds with Xiong's (2025) theory that lighting is a kind of writing in choreographic work.

The new possibilities for choreographic practice that have opened up with these technologies have deep implications for the conceptualisation of authorship in dance and for production practice. Interactive lighting systems add a generative element to choreography, as described by Birringer (2004), giving the choreographer a much wider range of options than a traditional choreographer, who is the only one responsible for the movement score. In *Moremi the Musical*, the use of tracking spotlights, projection mapping and programmatically controlled colour fields creates an installation in which the visibility of the performance experience is generated through multiple forms of dependence between human intention and technology. The interdependency is characteristic of what Birringer (2004) refers to as 'emergent choreographic possibilities of performer-technology environments' and, as such, has implications for how authorship and creative agency are attributed in contemporary production.

The light design narrative and emotional functions identified in this study contribute to scholarly understanding of how performance relates to the viewer, receiver, or audience. The management of the passage from the village council to the river ritual in *Moremi the Musical* exemplifies a storytelling approach that lies beneath textual and verbal attention and shapes the audience's orientation in the drama. This function aligns with the theoretical perspective of

symbolic interactionism on symbolic processes in performance, as defined by Xiong (2025), who asserts that light is a symbolic tool that can convey narrative information and influence interpretation. The production's tonal consistency in the application of chromatic coding across its events indicates that this symbolic function can hold across lengthy, multilayered narrative structures in theatrical productions, suggesting methodological implications for further analytical investigation of lighting design in long-form theatrical production.

Moreover, the spatial and temporal manipulation qualities that today's light design technology offers require recognition of it as a formal resource rather than a technical gadget. Making *Moremi the Musical* a large kingdom, a deep river, and a heaven in the body of a small venue at Terra Kulture is not an accident but a vital part of its artistic vision. It is similar to what Basa (2023) says about light's ability to create spatial illusions not possible with physical scenography alone, and, of course, to the economics and logistics of production, especially in situations where physical resources might be limited. The result would indicate that investment in lighting technology and expertise can serve as an alternative to material scenic infrastructure and relate to budgeting considerations and the scalability of large-scale production in African performance contexts. This discovery aligns with the work of Amali and Badeji (2025), who showed that Nigerian theatre design has always been a recreation of limited physical spaces, and the use of contemporary technology is a continuation of this tradition.

The results of this study should be interpreted in light of the study's limitations. The main constraint is that analysing a recorded performance film does not wholly simulate the experience of a live audience. The more affective intensity of the light effects captured and documented in this study may be more pronounced in the live theatre than in the recorded medium, and the three-dimensional qualities of the spatial manipulation created through projection mapping and field lighting in the theatre are partially lost in the recorded medium. This is a limitation of all forms of performance analysis using archival or mediated documentation and is recognised as limiting the generalisability of the findings. Another constraint is the single production used for the case study; this limits the number of productions available for comparative analyses, from which broader conclusions can be drawn for the general use of light design technology in African or Nollywood-inspired theatrical practice. The analytical framework developed in this study should be expanded to other productions, at varying scales and levels of technical resource.

The ethical issues in the use of AI for choreography are ripe for continued academic inquiry. With increased AI capabilities of creating choreographic content, issues of authorship, creative agency, and algorithmic bias arise. Future research needs to develop an ethical framework to guide human-AI collaboration without replacing human creative judgment. The cost of implementing advanced lighting design technologies is also high, with investments in high-quality projection systems, intelligent fixtures, custom wearable devices and specialist software out of reach for many companies. Cost-effective alternatives, such as open-source hardware and software, and funding models to expand access, are areas that need further investigation. The call by Badeji and Omotunwase (2026) for the development of institutions and the training of practitioners as prerequisites for sustainable digital performance practice in Nigeria also applies to light design technology and AI-assisted choreographic production.

Conclusion

The study demonstrates that light design technology has experienced a basic shift in its relation to dance, from making the dance visible, to becoming an integral part of the aesthetic, narration and experience structure of the dance. Based on academic research and the analysis

of *Moremi the Musical*, the technologies explored range from LED systems and interactive lighting to projection mapping and AI-assisted virtual environments, and have become more than just accompanying tools – they are integral to current dance practice. These technologies enhance the choreographic vocabulary, which allows the choreographer to control the visual aspects that define space, encode emotion and structure narrative.

This discovery is of great consequence to society, especially in Africa, where a performance environment is expected. The ability of light design technology to create large-scale spatial and narrative environments within the physical limitations of small venues is directly relevant to the development of large-scale, ambitious theatre productions in Nigeria and across the continent. *Moremi the Musical* shows how a large-scale theatrical narrative with a cultural basis can be maintained without the large-scale physical infrastructure typically seen on Broadway or the West End, but rather through investment in lighting technology and the expertise required in lighting design. The results also indicated that technical training and institutional support for lighting designers and production are being developed. This trend may continue to evolve with the introduction of AI into the choreographic process, where the interplay between human and machine creativity becomes a dynamic focus for artistic and ethical exploration. Collaboration across disciplines is a prerequisite that must be ongoing, and new designs and engineering approaches are also needed to achieve greater access and sustainability in technologically demanding production.

Author Contributions

The first author participated in conceptualisation, literature review, data analysis, writing and revision of the manuscript, while the corresponding author provided part of the analysis and methodology.

Declaration of Competing Interests

The authors have no competing financial or personal interests that could have biased the results or their interpretation.

Use of Artificial Intelligence Tools

This manuscript was not created, analysed, or edited with the help of any artificial intelligence tools. All written work, argument and interpretation is the original work of the authors.

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