UNIVERSITY OF EDUCATION, WINNEBA

INNOVATION IN SOUND PRODUCTION PRACTICES IN THEATRE EDUCATION: A CASE STUDY OF THE DEPARTMENT OF THEATRE ARTS, UNIVERSITY OF EDUCATION, WINNEBA.

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**A dissertation in the Department of Music Education,
School of Creative Arts, submitted to the
School of Graduate Studies, in partial fulfilment
of the requirements for the award of
Master of Philosophy Degree
(Arts and Culture - Technical Theatre)
in the University of Education, Winneba**

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DECLARATION

STUDENT'S DECLARATION

I, Elvis Edem Asuo Nyarko, declare that this dissertation, except quotations and references contained in published works, which have all been identified and duly acknowledged, is entirely my original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: ……...

DATE: ……

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work were supervised in accordance with the guidelines for supervision of dissertations as laid down by the University of Education, Winneba.

PRINCIPAL SUPERVISOR: Prof. Evans Asante

SIGNATURE: ……

DATE: ……..……...

DEDICATION

To my late, lovely Parents, Mr. & Mrs Affram, who believed in me and have always been my audience.

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ABSTRACT

The theatre's visual and non-visual design elements, including scenery, lighting, sound, costumes, and make-up, have benefited greatly from the advancement of technology. The role sound plays in theatrical productions is essential. The study investigates the relevance of sound reinforcement to sound production during stage productions, also looks into the basic processes involved in theatrical sound production and reinforcement, and lastly develops an innovative sound reinforcement approach for performances. Using the semiotic theory, the design was anchored on participant observations, interviews, and group discussions. The study showed that sound plays a vital role in theatrical production to aid comprehension. The study further revealed the relevance of sound amplification to stage productions and aimed at the basic process involved in theatrical sound production. The study examined and looked into how to improve sound production during staged performances. The study concludes that facilities built for theatrical productions should be well-designed to meet standards and well-equipped with the requisite systems and technology to aid sound production, and users should be taken through the requisite training in how to operate the facilities provided.

CHAPTER ONE

INTRODUCTION

Background of the Study

Theatre has become more popular over the years, and technical theatre has been a visible feature in raising theatre to the level it has reached in the world today. Technical theatre is a scientific as well as technically oriented area of specialisation in theatre education, and in some of our public universities in Ghana, namely the University of Ghana, University of Cape Coast, and University of Education, Winneba, theatre and music are now outstanding, unique programs. The University communities rely on these departments for performances whenever there are events that demand the assistance of these units in the various universities. However, considering sound production, it is imperative now more than ever that the music and theatre departments in these noble universities must have state-of-the-art facilities, equipment, and instruments to train and equip their students, thereby giving them first-hand practical experience. Kendrick (2015) corroborated and postulated that;

> Before the advent of manufactured light and visuals, the theatre was largely an outdoor event of auditory experience. From above, gatherings as an audience, the theatre relied entirely upon the effective transmission of sound to reach the imagining ear. As obvious as this may seem, this innate aurality of theatre is at odds with the most commonly cited etymological root of theatre as a 'seeing place'. (p.12)

Kendrick (2017) states that "Theātron (which stems from the Greek theaesthai, which means 'to see') does denote a 'place for viewing', a particular site (whether natural or

built) where people are gathered to spectate; yet the same root term for spectator, theōreein, is also directly related to theōriā, the root of theory, which is a reminder that a theatre is also a place of thoughts and ideas, of theses and discourses, which invite modes of engagement and exchange that are not necessarily visual". (p. 27).

Spectatorship was certainly present in early theatre practices, as demonstrated by devices such as the deus ex machina, which produced mechanical illusions, and the use of painted scenic backdrops in ancient Greek theatre. However, scholars who study theatre sound suggest that such visual elements were introduced later in the development of Greek and Roman theatre. Initially, these theatres were primarily designed to enhance the acoustic qualities of performances so that sound could be effectively transmitted to the entire audience (Vitruvius, 2009).

Furthermore, when visual elements were later incorporated into theatrical performances, they were typically reserved for particular moments such as entrances, transitions, or interludes. These visual devices served specific dramatic purposes rather than defining the overall nature of the theatrical form. Consequently, the experience of early audiences depended largely on what they heard, as emphasized repeatedly by Vitruvius (2009).

Theatre historically functioned primarily as an experience for the listener, where audiences gathered to hear performances delivered through speech, soliloquy, and song by actors, musicians, and choruses whose voices resonated throughout the performance space. Even the visual elements found in Greek, early English, Medieval, and Renaissance theatre were believed to support and enhance this auditory dimension. Historical accounts of theatre practices from the formal amphitheatres of Ancient Greece to the performance spaces of Renaissance London indicate that audience

engagement was largely shaped by sound. In this sense, it was the actors' voices and vocal expression that made the performance perceptible and meaningful to spectators (Kendrick, 2007, p. 29).

This perspective supports the argument that Shakespeare's plays were primarily experienced through listening rather than visual observation. The spoken text enabled audiences to imagine the dramatic environment, as the language of the performance brought the stage world to life within theatre spaces that were acoustically designed to facilitate attentive listening. Although the introduction of stage lighting later enabled the emergence of elaborate scenic displays in the nineteenth century and eventually contributed to the development of realistic three dimensional stage environments in the twentieth century, the importance of sound in theatre remained significant. Theatre practitioners continued to recognise and develop the expressive potential of sound, treating the performance space not only as a visual setting but also as an acoustic environment that shapes the audience's experience of the performance.

The creative arts provide valuable opportunities for individuals to acquire new knowledge and practical skills. Various programmes in areas such as music, theatre, and painting enable participants to explore artistic expression while developing their creative abilities. Participation in these activities often contributes to increased self confidence, as individuals discover previously untapped talents and receive positive recognition from peers and audiences when they perform or display their work. In addition, acquiring artistic and technical skills can improve employability and career prospects. For instance, individuals involved in theatre programmes not only learn performance related skills such as singing, dancing, and acting, but also gain exposure to technical aspects of production, including lighting, set design, sound, make up, and

costume. As a result, participants develop a broad range of competencies that prepare them to function effectively within the creative industry on both local and global levels. These diverse skills can be demonstrated and applied in various professional contexts when opportunities arise.

Visual design aspects of the theatre include scenery, lighting, sound, costume, and make-up, which have received many of the benefits that accrue from developing technologies. The influence of technology has an obvious impact on the art of theatre. Everts (1998) simply explains technology "as an object which does something that works or helps". In the University of Education, Winneba, one of the faculties is the School of Creative Arts, under which there is the Department of Theatre Arts. Technical theatre practice is an important aspect of its theatrical productions. The rapid development of theatre technology has significantly transformed theatrical aesthetics, elevating stage production to remarkable levels. As a result, technological innovations are increasingly employed to create engaging and spectacular performances that capture the attention and admiration of audiences. Iyamah and Akpughe (2017) make it clear from the evidence Enendu (1993) provides that "theatre summoned technology to support the arts" (p. 292). According to Thomas and Dugan (2009), sound design and sound reinforcement are comparatively young members of the theatrical design family. Computer technology for sound and music, much of which emerged over this past decade, continues to become widely available, making intricate sound designs more accessible now than in the past for designers and theatres alike. Sound design and sound reinforcement is a technical art form specialised in many ways by which complex systems are engaged to create, record and then edit sounds, often using specialist equipment and software. Therefore, the Department of Theatre Arts needs or requires good performance facilities to aid

theatrical practice and enhance its work for the benefit of its students and the larger society. The Department has an impact on national development due to the great influence that productions have on society.

Iyamah and Akpughe (2017) posit that for theatre performances to attain a level of optimum satisfaction, the need, help, and assistance of technology is not an outrageous venture but a necessity. Since it is an obvious fact that theatrical performances cannot attain the level of optimum satisfaction without the assistance of technology-based equipment, which is a necessity, theatrical practitioners from the academic environment should be skilled with the operation of equipment and the associated workflow to be effective in their delivery. However, it is also imperative that sound designers develop their creative abilities to better envisage and create sounds that are appropriate to the task.

The role sound plays in theatre production is essential indeed. In the first semester of the 2019/2020 academic year, Fred Agbeyegbe's play *The King Must Dance Naked* was staged by the Department of Theatre Arts. The productions were all box office successes. The Amu Theatre auditorium was filled for each of the four nights that the play was staged. The question is, did every member of the audience get the full effect of the sound to fully comprehend the play's message wholly? Also, plays like The Adventures of Sasa and Esi, Ananse in the Land of Idiots, and The Birth of the Mystery Child were affected negatively by sound during their stage performances. Actors were seen on stage; all four technical theatre elements were fully engaged except sound, which is a pivotal force of theatre productions. There have been instances where people like Professor Kola Wale Rahim, Dr Ebenezer Brew Riverson, Prof. Samuel Yirenkyi, and Mr Bismark Odum Sackey complained

about the nature of sound during staged productions. We should not forget that theatre is normally between two sets of people: the actor and the audience. This is a department that has been in existence for over twelve years and if there are issues with sound production, then sound reinforcement has to be given the necessary attention with regards to theatre productions in the Amu theatre, and at the time of writing this thesis, the new theatre in the recently commissioned School of Creative Arts building to aid comprehension of theatre productions that will be staged there. This is a study that will enhance the understanding of sound production and sound reinforcement in the department, and how the department can be better positioned to affect sound in various productions and how enhanced emphasis can be placed on improving acoustics for audiences to enjoy the production, irrespective of wherever one may be seated in the auditorium.

Research Problem

University-based theatre is expected to serve as a microcosm and prototype of professional theatre practice in society, particularly in the training of practitioners and the application of technical theatre technologies. However, within the Department of Theatre Arts, sound production, an essential component of technical theatre, has faced persistent challenges. Theatrical sound design and sound reinforcement have often been inadequate, negatively affecting live performances and audience engagement.

Despite full-capacity audiences in some performances, audibility remains a major concern, especially for audience members seated from the middle to the back of the auditorium. Actors frequently resort to shouting rather than effective voice projection, resulting in vocal strain and the loss of clarity in performance delivery. These challenges have been evident in several staged productions within the Department,

including *The King Must Dance Naked*, *The Birth of the Mystery Child*, *The Adventure of Sasa and Esi*, and *Ananse in the Land of Idiots*.

Additionally, poor sound quality has adversely affected video recordings archived in institutional libraries, as recordings often capture intrusive ambient noise and static caused by the auditorium's structural design. Despite the recurring nature of these issues, limited scholarly or practical intervention has been undertaken to address sound production challenges in the Department. This gap underscores the need for a systematic study into theatrical sound production and sound reinforcement within university-based theatre practice.

Purpose of the Study

This study seeks to propose that long-term measures be instituted to tackle the issues of sound production in the Department of Theatre Arts. In the interim, the researcher's work or project focus is to critically examine theatrical sound design and sound reinforcement in the Department, to come up with innovative interventions for theatrical sound production/enhancement, and to further generate keener student interest and skill development in that area.

Objectives of the Study

1. To explore the relevance of sound reinforcement to sound production during productions in the Department.
2. To outline the basic processes in theatrical sound production cum reinforcement.
3. To develop an innovative sound approach for performance.

Research Questions

1. How relevant is sound reinforcement to sound production in the Department?
2. What are the basic processes involved in theatrical sound production?
3. How can sound production be improved during productions in the Department of Theatre Arts?

Significance of the Study

The results of this study will build and deepen our knowledge in sound reinforcement, better captivate patrons to the Department's productions and enrich students' knowledge and skills for aggressively competitive duties in and out of the University community.

Delimitation

The study was limited to the Department of Theatre Arts, University of Education, Winneba, and focuses on general sound reinforcement in the field of theatrical sound production. The study, however, was limited to productions that were staged and were affected in one way or another by sound production in the department's auditorium. A sample size of fourteen (14) was taken for the study, and it embodied four sets of groups (A, B, C, and D), which constituted the Development Officers, Actors, Technical Instructors, and Secondary respondents who had the requisite experience and knowledge that would enhance the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

The preceding chapter presented the background of the study and outlined the statement of the problem, as well as the objectives and research questions guiding the research. In this chapter, related literature and concepts or theories underlying the study are discussed. A review of related literature entails the systematic process of identifying, locating, and analysing scholarly materials that are relevant to a particular research problem. Such materials may include books, chapters in books, journal articles, abstracts, reviews, monographs, dissertations, research reports, and electronic sources. The primary aim of this review is to present a clear and balanced overview of the major concepts, theories, and empirical findings that relate to the subject of the study. It goes beyond simply summarising the contents of books and articles or presenting isolated descriptions of previous research. Rather, it synthesises the body of existing knowledge on the topic while demonstrating the researcher's ability to critically evaluate and interpret it. Through this process, the researcher identifies what is already known in the field and engages with the scholarly discourse from a thoughtful and analytical perspective. As Toracco (2005, p. 356) suggests, "An integrative literature review is a form of research that reviews, critiques, and synthesises representative literature on a topic in an integrated way such that a new framework and perspective on the topic are generated".

This ultimately indicates that the literature review creates a clear conceptual understanding by critically examining existing studies and drawing meaningful conclusions. The review requires a scholarly and structured style of writing in which evidence must be properly documented and arguments supported. It also demonstrates

the researcher's ability to handle relevant sources effectively, interpret ideas analytically, and integrate and synthesise information with existing knowledge in the field.

This chapter examines relevant literature on theatrical sound production, emphasising how sound enhances performances in the Department of Theatre Arts, University of Education. Theatre can be seen as a dynamic reflection of society—a medium through which human experiences, emotions, and stories are expressed. As Wilson (1998) notes, theatre encompasses the performing arts, including dance, drama, and music. In contemporary practice, the role of sound has expanded beyond simple amplification or background music; it now actively shapes the audience's experience, supports narrative development, and contributes to immersive, multi-sensory performances. Advances in sound technology and design have transformed how theatre is created and perceived, highlighting sound as a central element in achieving the full artistic potential of modern productions.

Sound in the Theatre

Sound in theatre extends beyond the simple selection of appropriate sound effects for a production. It also plays an important role in indicating the time and place of the dramatic action, while helping to shape and intensify the mood and atmosphere of the performance. Kendrick and Roesner (2011) do not mince words in suggesting that sound has always been with us; indeed, all nature, by inference, is a product of sound, and harnessing sound for efficacious use is what theatre is all about, even the sound of silence. The discovery of the possibilities of sound in the theatre is an ongoing process. Theatre as a visual experience is enhanced richly by the (deliberate) engineering of sound. Sound collaborates with performers' mobility on stage from moment to moment, which results in a transactional experience between the audience

and the performers on stage. Ultimately, carefully rehearsed movements, based on either a dramatic text (or an idea for improvisation), are transformed into the language of body, lighting, props, costume, etc., and of course, sound in aesthetic cooperation. According to Finelli (2012), the wholesomeness of overall performance cannot discount the aural aspects, which over time have assumed a special place and require a thorough theatre lookup at a time of technological advancement. This would provide a special entry point for historical analysis while raising necessary theoretical questions about recording, reproduction, the interplay of staging and recorded sound onstage, and the act of listening to itself. According to Finelli, notwithstanding the promising effort of scholarship and practice to bring sound as employed in movies or film documents up to par to reflect similarly in the archives of theatre productions, the student of sound still lacks an integral framework ample to bring up sound as a discipline in theatre scholarship to such a level that it could make more incisive contributions to the field. Finelli insists that scholars must always recognise the importance of sound to the history of the art form since the theatre is a place for listening as well as for seeing (as traditionally acknowledged). So, how to target spectators to attend to the mise-en-scène (i.e., the totality of the scenes and acts that fuse to realise a production) relies upon factors like sound reproduction, reinforcement, acoustics, dramaturgy, production processes, and effects. Finelli (2012) harps on the need to, time and again, revisit theatre history and re-evaluate performance theory and criticism from the perspective of the aural or auditory to address the traditional dimensions of voice and other agents involved in sound transmission and reception.

Audio technological know-how and the manipulation of sound physically/acoustically and digitally have an effect on the aural environment in a live setting, particularly, though not always exclusively. However, how to design a sound surrounding that aids

a theatre production is imperative. It can impact the audience's perception of the messages in the production in particularly subtle, unconscious ways, and any slight alteration in the tone or ambient sound can alter the temperature of a scene gradually or instantaneously. Theatre is simultaneously a response to, and a reflection of, contemporary and historical moments. All aspects of theatrical design work together to create this response and reflection, with every detail carefully weighed and considered. According to Kaye and LeBrecht (2009), contemporary theatre has moved beyond the traditional notion of sound as merely a collection of isolated sound effects. Sound is no longer treated as an occasional addition used to cover scene changes or facilitate transitions. Instead, it has become an integral component of theatrical expression. Elements such as door buzzers or thunderclaps are no longer perceived as independent effects but as parts of a broader and more cohesive sound design that contributes to the overall meaning and experience of theatre. Sound functions as a comprehensive process that shapes how audiences perceive and interpret performance, linking different elements of the theatrical experience and reflecting the rhythms of everyday life. It also serves as a fundamental medium through which humans communicate and connect with others. Furthermore, Kaye and LeBrecht observe that in contemporary theatre the microphone plays a role similar to that of the mask in ancient Greek theatre. It simultaneously creates a sense of intimacy and distance, concealing and revealing the performer while acting both as a protective layer and as a powerful tool for projection and exposure.

Kendrick and Roesner (2011) argue that sound in theatre cannot be regarded as pure music; instead, it operates as what may be described as impure music. This form of sound remains deeply connected to aspects of performance that it may appear to conceal, including the physical presence of performers, the unpredictable

circumstances of live performance, and the varying levels of audience attention and noise. The theatrical experience is not limited to sound alone but also includes visual staging, the performances of actors, and the coordinated movement of bodies within the performance space. These elements collectively create a dynamic interaction of bodies, forms, colours, and movements that shape the character and identity of sound in theatre. Within such an environment, sound interacts with a variety of noises and auditory elements, creating an atmosphere that enriches the performance and influences how each spectator experiences the fictional world of the stage.

Dion (1997) notes that many people believe sound films were first introduced in 1928 with the release of Warner Brothers' The Jazz Singer. Although this film is widely recognised as one of the earliest successful films to synchronise sound with motion pictures, experiments combining sound and visual images had already begun much earlier. From the early stages of cinematographic development, inventors explored ways to integrate sound with moving images. Thomas Edison, for example, proposed in 1887 the possibility of creating a device that could perform for the eye what the phonograph had already achieved for the ear. He suggested that by combining the two technologies, both sound and motion could be recorded and reproduced simultaneously. Early diagrams and illustrations of his experimental work show the inclusion of a phonograph to accompany visual recordings (Dion, 1997, p. 8).

Vesna (2007) further examines how individuals perceive sound, particularly focusing on the concept of auditory object perception. An auditory object refers to a sound that can be distinguished from other surrounding sounds. In psychoacoustics, a central question concerns how listeners are able to separate these auditory objects from one another and from background noise. The psychological field that closely addresses this

subjective perception of sound is Gestalt psychology, which emphasises how individuals organise sensory information into meaningful patterns. According to Gestalt theorists, listeners typically distinguish auditory objects by grouping sounds into figures and backgrounds, enabling them to interpret complex auditory environments more effectively. According to Gestaltists, humans usually separate the auditory objects by grouping them into figures and backgrounds, and the mechanisms for creating "visions of sound" are based on the following principles:

- The similarity speaks about how sounds are grouped into one perceptual stream if they are similar in pitch, loudness, timbre, and location.
- Good continuation, where smooth changes, with all constituent parts correlated with each other, offer the impression of one whole. The abrupt changes usually indicate that the source must have changed.
- The common fate deals with two components of sound undergoing the same changes in time; these are usually grouped into an auditory object.
- Belongingness is explained as a single element that can only form a part of one stream at a time.
- The mechanism of masking frequencies is a continual sound interrupted by a much louder sound that covers or disguises the discontinuity of the cut.
- Attention streams to which listeners pay attention are usually only one auditory stream at a time.

The principles and mechanisms discussed above assist humans in distinguishing auditory objects from one another. This understanding also enables sound designers to create artificial soundtracks for films that produce a highly realistic auditory experience. Today, it is well known that the following are some of the basic pieces of

information used to separate auditory objects:

- Timbre (spectrum change, onset transients)
- Fundamental frequency - correlated changes in amplitude or frequency
- Location (Physical distance of the auditory objects determines our perception.
- In contrast with previous sound-time-varying patterns (the rhythm of sound should correspond with the rhythm of objects on the screen (Vesna, 2007, p.8).

When sound originates from a single source or location, listeners tend to perceive it as a unified auditory object. These perceptual principles, among others, are widely applied in the creation of soundtracks and the design of "sound space" in contemporary live productions. Sahai (2009) explains that sound in theatre may take the form of voice, music, or sound effects. In many productions, sound functions as a supportive element that enhances the overall impact of the performance or reinforces the central aspects of the text, physical action, or visual spectacle. In this regard, sound often serves a complementary role that supports and intensifies the main dramatic events within a theatrical production.

Live Sound Reinforcement in Theatre Production

In today's technologically advanced society, various forms of audio systems have become an integral part of everyday life. Most households possess basic audio devices such as stereos or radios. However, professional sound reinforcement systems are far more complex than these domestic devices. Although they operate on similar fundamental principles, they demand a higher level of technical knowledge and understanding from their users. Vesna (2007) notes that spatial perception represents an area where science and art strongly intersect. The acoustic environments people experience are often shaped through sound in film and television. Sound systems in

these media are designed to reproduce the directional characteristics of sound as they occur in the real world. Vesna further explains that an important aesthetic challenge lies in determining which sounds should represent particular locations, since visual images are confined by the boundaries of the screen while sound is not restricted in the same way. Spatial perception of sound involves three dimensions: horizontal, vertical, and depth. The horizontal and vertical localisation of sound is usually supported by the visible placement of the sound source on the screen. However, depth perception is more difficult to determine because fewer auditory cues are available to indicate the distance of a sound source compared to the other spatial dimensions. From Vesna's point of view, there are several mechanisms for hearing to obtain depth estimates, and these include:

- The amplitude and brightness of the source indicated that a closer source is louder and brighter than a distant one.
- Audibility, which talks of the ground reflection and how it changes with time outdoors
- The Doppler effect of moving objects is indicative of a longer reverberation time, which usually means larger spaces (Vesna 2007, p.9).

Tapia and Lyons (2016) describe sound reinforcement as a system designed to amplify sound and transmit it clearly to an audience. In contexts such as meetings and conferences, the primary objective is the live reproduction of the human voice so that participants can clearly hear and understand the intended message. They explain that most sound systems operate through the interaction of four main components: input, processing, amplification, and output devices. An input device introduces audio into the system. For acoustic sources such as the human voice, this is typically achieved through a microphone, which functions as a transducer by converting acoustic energy

into an electrical signal. Audio signals from electronic sources may also be fed directly into the system through cables. Processing devices are used to modify and manage incoming signals and are generally classified into mixers and signal processors. Mixers combine signals from multiple sources, accommodating anywhere from a few inputs to several hundred. Signal processors are used to refine sound quality and may perform functions such as equalisation, compression, and feedback suppression. In many systems, these processing functions are integrated into a single device. Amplification devices then increase the strength of the electrical audio signal so that it can effectively power output devices such as loudspeakers or headphones. Finally, output devices deliver the sound to listeners. Like microphones, loudspeakers also function as transducers by converting electrical signals back into acoustic energy that can be heard by the audience (Tapia & Lyons, 2016).

Leamy (1998) explains that several parameters can be adjusted to optimise the frequency response of a sound system in a live performance environment. These include the physical positioning of speaker arrays, the configuration of processing equipment, the application of equalisation, and the time alignment of system components. Time alignment, in particular, is a crucial step in improving a system's frequency response, while also serving other important functions in ensuring that the various elements of the sound system operate cohesively. For any massive sound configuration unit, the problem of time correction can be broken down into three fundamental areas for consideration:

- Alignment of individual sets of drivers with one another within a single enclosure.
- Alignment of more than a few enclosures inside an array.

- Alignment of more than a few arrays and subsystems masking distinct zones of a venue.

In stage concert sound reinforcement systems, time alignment serves an additional and crucial purpose, which is to synchronise the entire sound reinforcement system with the original sound produced on stage. Leamy explains that in concert settings, sound systems are intended to function as an extension of the performers' actions rather than as a separate source of sound. High-quality sound systems therefore operate in a way that appears transparent to the audience, allowing listeners to focus their attention on the performers without perceiving the sound as coming from loudspeaker arrays. Accurate time alignment is essential for achieving this effect. The process involves delaying the main sound system so that it aligns with the natural sound produced by the performers on stage. When this alignment is properly achieved, the audience's attention is not drawn to the loudspeakers; instead, the reinforced sound appears to originate naturally from the performers themselves.

Whitney (2018) notes that in order to amplify the sounds produced by performers for audiences who share the same space, live sound engineers rely on a range of technologies that repeatedly convert sound from one form to another. These technologies transform acoustic sound into electrical signals, transmit and amplify those signals, and then convert them back into acoustic sound before reaching the listener. This process may occur through multiple stages before the final amplified sound reaches the audience. Whitney describes this chain of transformations as a process of technical and experiential transduction that mirrors the way humans naturally perceive and interpret sound (Whitney, 2018, p. 26).

Khoury et al. (1998) point out that optimising loudspeaker placement and sound processing for theatrical performances can be a complex task. Traditional trial-and-error methods are often time consuming, particularly in venues that host frequent performances with changing configurations. One major difficulty is assessing how adjustments to loudspeaker positions or processing parameters affect every listening position within the venue. While it may be relatively easy to optimise sound quality for a single ideal listening location, commonly referred to as the "sweet spot," the real challenge lies in achieving balanced sound coverage for the entire audience. The goal for sound designers is therefore to reach a compromise that ensures the largest possible number of audience members experience clear and intelligible sound, while minimising areas in the venue where the listening experience is significantly compromised. Sound reinforcement is when you make something louder, and you also shape the sound, so that what the audience hears reinforces what is happening on stage. An example of sound reinforcement is when actors are mic-ed so the audience can hear them perform over a live orchestra. One of the most common complaints about live productions is that the audience cannot hear the actors, or if the voices are not loud enough, the audience cannot understand what the actors are saying. Bad sound is usually the result of one or more of the following 3 problems:

- Poor projecting/enunciating, which must be fixed by the director and the actors.
- Wrong or faulty Equipment
- Operator Error/Lack of training

The individual responsible for ensuring high-quality sound at a live venue is commonly known as the front-of-house sound engineer. This professional manages the sound reinforcement system through an audio mixing console, often referred to as a

soundboard or sound mixer. Moore and Hill (2018) explain that in many sound reinforcement and reproduction situations, effective audience coverage can only be achieved through the use of multiple electro-acoustic transducers, such as loudspeakers, emitting coherent signals at similar sound power levels. They further note that when these transducers are not arranged in a way that allows for proper acoustic coupling across their operational frequency range, differences in the distance between the loudspeakers and listening positions can produce phase variations between the signals emitted. As a result, the combined signals may produce a frequency response that depends on these path-length differences, which ideally should remain within a 180-degree range to maintain sound quality. Kendrick (2017) also emphasises that theatre aurality has emerged as an important field that addresses contemporary and evolving sound practices in theatre. These practices extend beyond the technical use of sound effects, as theatre practitioners increasingly engage with sound within a broader aesthetic framework that considers the wider auditory environment of performance.

Theatre Acoustics and the Effect of Architecture on Sound

Llewellyn (2002) explains that the theatre auditorium functions as an integrated performance environment where interaction between actors and audience can be encouraged. The theatrical experience begins the moment spectators enter the theatre, even before the performance itself starts. For this reason, every element of the auditorium should be intentionally designed to create the appropriate atmosphere for both performers and audience members. Since the earliest times when humans gathered to share stories and enact scenes from everyday life, the need for designated performance spaces has steadily developed. Llewellyn further notes that theatre architecture has evolved from the open-air amphitheatres of ancient Greek and Roman societies to the wide range of theatre forms that exist today. While certain designs may

be more suitable for specific types of performances, no single structure or size can be considered universally ideal. The most appropriate theatre design depends on its intended function, such as film screenings, lectures, stage plays, or musical performances, as well as the scale of the production and the size of the audience it must accommodate.

Burkart (2008) describes acoustics as the characteristics of the physical space in which dramatic action occurs. When evaluating how sound behaves within a performance environment, it is important to consider the surrounding surfaces and materials through which sound travels. Hard surfaces are more likely to produce reverberation, large empty spaces may generate echoes, and soft or absorbent materials can reduce or dampen sound. Carlos (2005) similarly emphasises that although architectural acoustics often focus on the interaction between sound waves and room boundaries, the first sound wave reaching the listener, known as the direct sound, plays the most significant role in shaping how sound is perceived.

Gjestland (2019) suggests that designing a cinema auditorium can be relatively straightforward if established acoustic guidelines are followed. However, if every designer adhered strictly to these rules, all auditoriums would appear identical. Therefore, while guidelines are important, the primary goal should always remain the creation of an environment that provides the audience with the best possible visual and auditory experience.

Ancient Greek and Roman theatres are widely recognised for their remarkable acoustic properties. However, it is less commonly acknowledged that different types of theatres were constructed for distinct purposes, each with its own acoustic characteristics. Holger (2013) notes that the ERATO research project investigated the acoustics of both

enclosed and open-air theatres, as well as the Odeon, using digital reconstructions based on archaeological evidence. Musical instruments and short musical excerpts were recreated and recorded in order to simulate the acoustic environments of these historical theatres. Although Greek and Roman theatres are often considered acoustically perfect, the semicircular seating arrangement sometimes produced acoustic challenges. Rindel (2013) explains that the Roman architect Vitruvius described four types of sound reflections in theatres, including one referred to as "circumsonant," which may correspond to what is now recognised as focused echo. Computer simulations of historical theatre structures have confirmed that echoes could occur in certain audience areas. One proposed solution involved introducing sound-absorbing elements within concave surfaces of the seating areas, similar to the sounding vessels described by Vitruvius. These vessels were believed to function as resonators placed in niches between seating tiers. However, later research suggests that their acoustic impact may have been minimal and that Vitruvius relied heavily on earlier Greek theories, particularly those associated with Aristoxenus, a philosopher and music theorist of the fourth century BC.

Artaud (1958) proposed a radical reinterpretation of theatre space in which the traditional separation between stage and auditorium would be eliminated. In his vision, performers and spectators would occupy a shared environment without barriers, allowing direct interaction between the two groups. By placing the audience within the centre of the dramatic action, spectators would become physically and emotionally immersed in the performance. This approach requires abandoning conventional theatre architecture and instead using adaptable spaces such as hangars or barns that can be reconstructed to support this immersive theatrical environment.

Baugh (2005) notes that in ancient Greek and Roman open-air theatres, sound reflections from the ground often increased sound levels and improved audibility. In enclosed venues such as concert halls, however, sound interacts with multiple architectural surfaces, producing reflections with different amplitudes, directions, and time delays. For listeners seated in the audience or performers on stage, this results in a sequence of reflected sound waves arriving after the direct sound. The pattern of these reflections forms what is known as the room's impulse response, which serves as an acoustic signature that characterises the sound behaviour of a particular space.

Sigismondi (2008) observes that poor acoustics can present significant challenges for inexperienced theatre venues. Multipurpose spaces such as gymnasiums or cafeterias, which are often used for school or church productions, are acoustically problematic because they produce excessive echoes and reverberation. These conditions reduce speech intelligibility and limit how loudly sound systems can be amplified without causing feedback. Professional theatrical productions therefore require carefully designed environments with controlled acoustics that support clear sound reproduction.

Bowler (2015) explains that sound naturally reverberates within the space where it is produced, but technological systems can enhance or manipulate this presence. When sound is amplified, the perceived size of the space may seem to shrink, while reduced sound levels may make the space feel larger. Consequently, sound design plays an important role in shaping how audiences experience the spatial environment of theatre.

In terms of sound isolation, Gjestland (2019) notes that the sound reduction index (Dw) is used to measure how effectively an auditorium is acoustically separated from its surroundings. When environmental noise levels are low, a Dw value of approximately 65 dB may be acceptable. However, if neighbouring spaces produce higher noise levels,

or if adjacent auditoriums share walls, higher values between 70 and 75 dB may be required. Elements such as walls, doors, and ceiling systems all contribute to acoustic isolation, and these components are usually tested in laboratories to determine their soundproofing performance using the weighted sound reduction index (Rw).

Kermode (2013) argues that theatre space is shaped not only visually but also acoustically. Architectural design elements such as surface textures, shapes, and materials influence how sound is absorbed and diffused throughout the performance environment. Through these spatial and acoustic arrangements, theatre intensifies and reinterprets aspects of everyday life.

Meyer Sound (2010) highlights the development of active acoustic systems such as Constellation, which represent a major advancement in acoustic technology. Traditionally, performance venues were designed for specific uses, with theatres optimised for spoken drama, concert halls for music, lecture halls for speech, and cinemas for surround sound. However, modern venues often host a variety of events, making it difficult for a single acoustic design to suit every performance type. Mechanical solutions such as movable draperies or orchestra shells have been used to modify acoustics, but these approaches can be costly and unreliable. Systems like Constellation provide a digital solution that allows the acoustic characteristics of a space to be adjusted electronically, enabling the same venue to accommodate a wide range of performances while maintaining optimal sound quality.

Burris-Meyer and Mallory (1985) note that speech and music often resemble sequences of pulsed waveforms rather than continuous sound. As a result, two rooms may appear acoustically similar when measured through conventional reverberation analysis yet still differ significantly in perceived acoustic quality. To address this issue, researchers

examine the response of a room to short sound pulses, using models that simulate sound reflections from walls and surfaces.

Inácio (2005) emphasises that the final stage in the transmission of musical sound to listeners is the room or environment in which the performance takes place. If the design of a performance space is not given the same careful consideration as musical instruments themselves, the listening experience may be degraded. Modern concert hall design began to develop a scientific foundation following the work of Wallace Sabine at the end of the nineteenth century, particularly through his formula for calculating reverberation time. Reverberation depends on the interaction between sound waves and the surfaces of a room, making it essential to understand both the radiation characteristics of musical instruments and the acoustic properties of building materials.

Eggenschwiler (2005) similarly argues that theatre halls should be designed according to modern acoustic principles to ensure high performance quality while remaining cost-effective. Renovated venues often struggle to meet acoustic requirements because reverberation times may become excessively long for sound systems designed primarily for speech.

Ginn (1978) explains that building components intended to provide strong sound insulation across a wide frequency range must possess high mass and low stiffness. Although sufficient mass can improve sound insulation, excessive stiffness may reduce effectiveness by narrowing the frequency range over which insulation performs well. Increasing damping within structural elements can sometimes mitigate these issues by dissipating more of the sound energy that reaches them.

Burnett (2008) further observes that architectural design frequently prioritises visual aesthetics while neglecting acoustic considerations. As a result, urban environments and many public buildings often exhibit excessive reverberation and noise pollution due to insufficient attention to sound control. Biancorosso (2016) notes that early cinema buildings often contained little acoustic absorption, with decorative ceilings providing sound diffusion but minimal sound absorption. In contrast, modern cinema complexes commonly incorporate materials such as pleated wall curtains and other acoustic treatments to improve sound absorption and enhance the listening experience.

Theatre Sound Production

Vesna (2007) explains that sound in film and television primarily functions to support the narrative of a documentary, commercial, film, or television programme. In some instances, sound may communicate aspects of the story directly, while in other cases it serves to subtly enhance the dramatic effect of the production. Although sound and visuals are processed through different perceptual systems, audiences tend to perceive them as a unified experience without consciously separating the two elements. Consequently, the combination of sound and image can produce a stronger impact than either element alone (Vesna, 2007). This indicates that the relative importance of sound and visual elements in storytelling may vary from scene to scene and from moment to moment. From this perspective, sound in production is generally designed to integrate multiple components harmoniously rather than attract attention to itself. In many film and television productions, sound is assembled during post-production through the careful layering and blending of different audio elements to create a cohesive auditory experience. In contrast, live theatre relies on sound that is performed in real time alongside the actors, contributing to the interpretation and meaning of the performance. This coordinated use of sound in performance is commonly referred to as sound design.

Ryan (2017) also posits that sound art relies on context and the location of the work which has a foremost effect on how its audience interacts. When introduced as an installation, in a gallery or comparable location, the target audience has greater time to spend looking and listening to the work and is afforded the chance to talk about it with their pals and/or family. When presented in a theatrical context, there is, from time-to-time alienation where the target audience may additionally solely view what is occurring for a short period and not necessarily 'take part, even though it may be extra immersive.

Sound for movies and television is an aural experience developed to aid the story of a narrative, documentary, movie, or television program. According to Holman, sound may inform the story directly, or it may additionally be used circuitously to enhance the story (Holman 2010).

Inácio (2005) declares that sound usually used for programme configuration simply allows the calculation of the sound pressure level of the direct sound reaching a listener inside an auditorium meaningful. As it is well known, the human ear has a frequency-dependent degree of loudness perception, which is associated with the effect of the directionality of musical instruments and the attenuation by air absorption and geometrical divergence, allowing us to recognise that the direct sound in a concert hall might not be capable of providing the most satisfying listening experience. Therefore, the help of sound reflections in a closed room provided by adequately designed room surfaces is extremely important (Inácio, 2005, p.10). From the above, it means sound, in general, should be well defined by considering the space and configuration should be such that frequencies should be meaningful to the human ear by going through frequency cancellations, which I agree with Inacio.

Kaye and LeBrecht (2016) state that the increased use of sound in theatre productions is now not restricted to sound effects. Equal resources and planning are going into the recognition of musical scores. The use of live song is regaining prominence at all levels of theatre production. More prevalently, actors are being sought after because of their musical skills.

It is very obvious that sound designers, performers, and composers now try to work collectively to create special performances that use sound and tune as a foundational component of performances, and administrators who have grown up in this age of audio are now being professionally educated to work with track and sound. This advancement alone is offering some energy to the innovative use and development of sound and music for the Theatre. Burris-Meyer and Mallory (1985) postulate that the application of digital services to the management of sound in the reliable theatre has been the situation of a long-term lookup venture, and progress reports have been made from time to time before the Acoustical Society. Complete manipulation of the auditory thing was achieved. However, the acceptance of the technique has been delayed because the equipment was once too expensive to be included in the budget. This reviews the development under the Rockefeller Foundation subsidy of a modular sound, manipulation machine, which seems to be suitable for all wants of the reputable theatre and specialised wishes in different amusement forms.

Sound Design and Sound Designer

The arrival of theatre sound technology was once and continues to be viewed as an important area in the technical theatre when we consider live productions. Sound design is the art and practice of creating soundtracks for a variety of needs. It involves specifying, acquiring, or creating auditory elements using audio production techniques

and tools. Sound design is one of the richest tools at our disposal for making the piece say what we want it to, both literally and psychologically. Sound design purposefully communicates to an audience through recorded and created sounds that augment the visuals; sound design does not merely replicate what is happening on the stage, it is an additional storytelling component (Candusso, 2012). Sound design can be said to be the process of 'specifying, acquiring, manipulating, or generating an audio element' that is employed in a variety of disciplines such as television and theatre production, radio, filmmaking, and live performance (Adoyi, 2017). According to Fahlenbrach (2008), the embodied pattern that guides our perceptive, cognitive, and emotional experience is referred to as sound design. Due to its perceptive qualities and functions, sound can activate broad networks of bodily and cognitive associations. Accordingly, the sound design and music consciously intensify the emotional density by adding an accelerated rhythm to the performances.

According to Moesgaard, Hulgaard, and Bødker (2020), sound plays an essential function in our well-being, our journey around the world around us, and our grasp of products, services, and interactions. This means sound influences our experience of place, and it can modulate our feelings and attention. In a world of increasingly more ubiquitous digital technologies, sound might also be a valuable aid for sense-making as well as experience. Yet the possibilities and challenges of user participation in sound plan strategies are not well understood.

Vesna (2007) avers that Sound sketch/design is a technically innovative field and it covers all non-compositional factors of a film, a play, a music overall performance or recording, computer game software, or any other multimedia project. The history of the development of sound layout in theatre is very long. Sound design is directly connected with the development of sound in film and movies, and although this history

is not as long as the history of sound design in theatre, it is a film that inaugurated the profession of sound designer and opened a new creative field for sound professionals. Even though there have been more and more demands for top-quality sound, the profession of sound design is still struggling to obtain acceptance (Dakic, 2009). Despite these continual, extraordinary advances in technology, the profession of sound design was very late recognised as a creative field, not strictly based only on technique. Cinematic voices, even when sounding very natural, are no longer the mere playback of the recordings of actors' performances. Pauletto (2012) explains that sounds are carefully created and structured to match the characteristics of the characters they portray. The process of sound design is not the responsibility of a single individual; rather, there is no specific role known as a voice sound designer. Instead, sound design operates through a collaborative system that begins with voice recording during production and continues into post-production, where the sounds are edited, modified, and mixed to achieve the desired effect.

Kaye and LeBrecht (2016) argue that sound design is one of the most powerful tools available in shaping how a theatrical work communicates meaning, both physically and psychologically. It influences various aspects of a production, ranging from the selection of music to collaboration with composers, as well as the sounds produced by actors and those intentionally created to enhance the atmosphere of the play. These sounds help establish the emotional, cultural, religious, or geographical context of the performance. As a result, nearly every element of a theatrical production can be shaped and strengthened through effective sound design. Through the contributions of numerous practitioners and scholars, sound design has evolved into a recognized artistic discipline. This situation highlights the highly creative role of the sound designer within a theatrical production. The earlier period, when sound in theatre relied

on a few mono tape decks and a limited number of speakers, has largely disappeared. Contemporary audiences are accustomed to the advanced sound experiences provided by rock concerts, discotheques, multitrack cinema systems, and sophisticated home stereo equipment. As a result, they are less likely to accept low-quality or technologically limited sound in theatre. In addition, theatre directors have developed a greater sensitivity to sound and are increasingly unwilling to rely on basic "library" sound effects played through simple public address systems. Instead, professional sound designers strive to create more authentic and carefully crafted soundscapes. Rather than using generic pre-recorded effects, such as thunder from old sound effects records, designers often develop their own sound libraries, sometimes recording real environmental sounds such as storms. These sounds are then carefully edited and equalised to achieve the desired dramatic impact. Furthermore, the effectiveness of theatrical sound can be significantly enhanced through the strategic selection and placement of speakers, as well as through the use of stereo, quadraphonic, and panning techniques to create a more immersive auditory experience

According to Kaye and LeBrecht (2016), sound designers are required to possess a broad understanding of sound and remain attentive to the overall demands of a production. They must also understand how sound influences the psychological responses of audiences and avoid approaches that are overly literal in interpretation. Similarly, Vesna (2007) explains that the sound design process generally involves four main stages: recording, mixing, synchronisation, and editing. Each of these stages is complex and addresses a wide range of technical and creative challenges, which is why sound design typically requires the involvement of a team of specialised professionals.

The recording stage primarily focuses on capturing sounds that may later be used in the sound design process, ensuring that they are recorded with the highest possible quality. The effectiveness of this stage depends largely on the type of microphone used, as well as its directional characteristics. Directional microphones, for instance, tend to capture a higher proportion of direct sound compared to diffuse ambient sound. Additionally, the positioning of microphones during recording is a crucial factor that must be carefully considered to achieve the desired sound quality.

One challenge in sound recording is the tendency to match the sound perspective with the camera's point of view for each shot. In the early development of sound recording, attempts were made to align sound perspective with camera shots; for example, wide master shots were often recorded with greater reverberation than close-up shots. However, Vesna (2007) notes that mixing in sound production involves more than simply balancing recorded sounds. It encompasses microphone techniques, recording practices, and synchronisation, all of which influence the editing process. Technically, mixing refers to the dynamic adjustment of level controls for different microphones during recording to emphasise the desired sound while reducing others. In contemporary practice, mixing is no longer limited to the recording stage but has become an integral part of sound editing. Today, the term "mixed sound" or "final mix" generally refers to the completed soundtrack of a production.

Synchronisation in modern sound production has two main meanings. First, it refers to the process that ensures sound and visual images remain aligned and move simultaneously. Second, it describes the later studio recording of dialogue and sound effects—commonly known as Foley—which could not be captured with sufficient quality during filming.

Editing represents the final stage of the sound design process and leads to the creation of the final mix or complete soundtrack of the production. At this stage, all recorded elements, including dialogue, sound effects, and music, are combined to produce the final auditory composition of the work. Sound editors manipulate these elements using various editing techniques, including different types of cuts and transitions. For example, a vertical cut involves an instantaneous break in the audio waveform and is typically applied only when the sound amplitude is at zero to avoid unwanted noise. If applied at any other level, it may produce an audible click. As a result, diagonal cuts are often preferred in audio editing because they create smoother transitions. These cuts usually involve a short crossfade, typically about 10 milliseconds on a film track, and are commonly used when a seamless transition between sounds is required. In addition to these methods, numerous editing effects are now available to address discontinuities and enhance the overall quality of sound in film production.

Although the fundamental purpose of theatre sound has remained largely unchanged since its early development, the techniques and equipment used in sound production have evolved significantly. These advancements have made theatre sound an increasingly dynamic and complex field within technical theatre. The growing recognition of the sound designer as an essential member of the creative production team should encourage theatre students with an interest in sound for performance to pursue this area of study. Through such engagement, students can develop both creative and practical skills that enable them to understand the responsibilities of the sound designer while also appreciating the complementary role played by the sound operator in the overall production process. Guyer (2014) states that hearing necessities set up criteria for reverberation, ambient noise levels, sound intensity, time extent, and directionality that, in regular circumstances, will be shown to relate to the small print

of the Room's enclosure and boundary surfaces. Hearing factors additionally affect pit and stagehouse design, manipulate locations, and sound device criteria (Guyer, 2014, p.19).

Vesna (2007) further explains that theatre productions adopt different stylistic approaches, and the sound designer must respond appropriately to the overall artistic style of a production. Identifying the style of a production is essential because it helps to explain how and why particular sound design choices are made. Various theatrical styles require different sound design strategies.

For instance, realism refers to productions that attempt to represent real life as accurately as possible. In such productions, sound design aims to replicate sounds that would naturally occur in real environments. Realism may appear in two forms: total realism and partial realism. Total realism seeks to reproduce life as closely as possible, requiring sound effects that imitate real-world sound environments. Partial realism, however, combines realistic sound elements with non-realistic components, allowing designers to blend authenticity with creative interpretation.

Symbolism, on the other hand, focuses less on representing everyday reality and more on communicating abstract ideas or themes to the audience. In symbolist productions, sound designers may employ specific sound effects, musical motifs, or abstract soundscapes to express concepts, emotions, or symbolic meanings associated with characters and events.

Minimalism is another stylistic approach in which productions make use of minimal stage elements and rely heavily on the actors' performances to create meaning. In minimalist theatre, sound can play a crucial role in shaping the environment of the performance. Through carefully designed soundscapes, designers can evoke locations,

settings, or atmospheres without the need for elaborate physical scenery.

In fantasy productions, the sound designer is given the opportunity to construct imaginative and entirely new sonic worlds. This may involve the use of diverse sound effects, music, and atmospheric soundscapes to create magical or otherworldly environments. However, even in fantastical productions, the sound design must maintain internal consistency so that audiences can understand and engage with the imagined world being presented.

In addition to stylistic considerations, sound designers must also carefully manage technical elements such as sound levels, reverberation, echo, and fading techniques. Sound levels determine how loud or soft sound effects and music are presented during a performance. The choice of volume can significantly influence the atmosphere of a scene; for example, the quiet ambience of a library differs greatly from the intense sound environment of a nightclub. Extremely loud sounds may even produce physical sensations for the audience as vibrations move through the performance space. However, sound levels must always be balanced so that the actors' dialogue remains clearly audible.

Reverberation, commonly referred to as reverb, occurs when sound reflects off surfaces within a space, causing the sound to persist even after the original source has stopped. This effect may occur naturally within a performance venue or be artificially added using sound editing software. The character of reverberation varies depending on the environment; for example, sound reverberates differently in a cathedral compared to a classroom. By manipulating reverberation, sound designers can help audiences recognise the spatial setting or atmosphere of a scene.

Similarly, echo is a sound effect created when sound waves reflect off surfaces and return as distinct repetitions. Unlike reverberation, which blends reflections together, echoes are perceived as separate repetitions of the original sound. Echo effects can indicate specific locations, such as caves or tunnels, or convey emotional states such as isolation or loneliness.

Another important technique involves the use of fades, which refer to gradual changes in sound levels. Sound effects or soundscapes may be faded in (gradually increasing in volume) or faded out (gradually decreasing in volume) during a performance. These transitions can be used to introduce or conclude sound effects, or to adjust sound levels in response to stage action. In some cases, a sound may begin at a high volume, be reduced when dialogue or action begins, and then increase again toward the end of a scene, creating the impression that the sound has continued throughout the scene.

Although sound design in filmmaking is a relatively recent and innovative field compared to theatre sound design, it has significantly influenced the development of modern sound production techniques. The roles and responsibilities of sound professionals working in film are still evolving, but the film industry has played a major role in advancing sound technology and creative practices. As a result, considerable resources have been devoted to developing techniques for producing sound effects and ambient sounds that evoke emotional responses and immerse viewers in cinematic experiences. The creation of sound effects in film generally involves two main stages: the recording of sounds and their subsequent processing. Ultimately, the tools of sound design often rely on the ways in which human perception interprets and understands sound. The significance of sound design in theatrical and cinematic productions lies in its ability to shape the audience's experience and perception, ultimately influencing the

overall impact of a performance. Sound functions as a subtle yet powerful emotional communicator, conveying meaning and enhancing the narrative in ways that visuals alone cannot achieve. Without carefully designed sound, a production risks appearing flat and emotionally disconnected. To maximize its effect, sound must operate in a symbiotic relationship with visual elements, where both sound and image complement and reinforce one another rather than competing for attention. In contemporary visual culture, however, sound often struggles to assert its presence and importance. It is therefore essential for practitioners across all production disciplines to recognize and appreciate the critical role of sound design, understanding that effective sound can profoundly elevate the depth, emotional resonance, and engagement of a performance. In the context of narrative Western films, for instance, the absence of sound reduces the medium to mere moving images, depriving the audience of immersive storytelling and emotional connection. According to Levin (2009), the art of designing, enforcing, and executing a successful sound system for production is a very elaborate and worrying technique that requires experience and determination. He continues that the technique of getting from a notion to a functional gadget takes a lot of planning and compromise. The sound designer and engineer ought to have a very handy time perception and manage all elements of a sound machine for this utility (Levin 2009, p. 14).

Types of Sound Facilities for Theatre

The equipment used in theatre sound is typically more costly and must meet higher technical standards. Audio for Theatre explores the key components of a conventional theatre sound system, including wired and wireless microphones, mixing consoles, audio amplification and speaker placement, intercom and stage announcement systems, playback systems for sound effects, and power supply considerations. A significant portion of the curriculum focuses on the variety and characteristics of

different microphones, guiding production students to select the most appropriate device for each specific task. While Audio for Theatre does not provide formal training in acoustic or electronic theory, it emphasizes the practical skills and knowledge that audio engineers need to operate effectively in contemporary live entertainment environments and specialized theatrical settings. Tapia and Lyons (2016) state that

> The human voice and ear produce and detect tiny variations in air pressure – not 1's and 0's, whether it's a small meeting room or a large theatre, a public city council or a secure boardroom, a teleconference or a lecture, all sound systems begin and end in the analogue domain, and are subject to fundamental rules of physics. And so, today's sound systems are a blend of fundamental analogue tools like microphones and loudspeakers with digital signal processing and file-based data transfer and storage. Making a unique blend of technologies work together seamlessly takes a unique blend of knowledge.

Burkart (2008) asserts that moving beyond the fundamental principles of sound allows us to examine production practices and techniques that connect audio effectively to an audience centered experience. In radio drama, the microphone is the most critical tool for conveying sound. The technique of microphone use is essential for creating auditory "images" that the audience interprets, where even slight movements relative to the microphone can convey distinct meanings. The perceived distance from the microphone is also influenced by the type of microphone employed. Microphones are often categorized according to directionality, which refers to their sensitivity to sound in different spatial areas. The three primary types of directionalities are omnidirectional, unidirectional, and bidirectional. The key distinction among these types lies in the shape of the microphone's "field," which defines the area in which it is most responsive to sound (Flanagan et al., 1991). Sounds occurring within this "live

area" are captured most effectively and can be broadcast or amplified with optimal quality. Sounds produced outside of this field, in the "dead area," may still be captured but at a reduced volume, with the intensity diminishing as the distance from the microphone increases (Burkart, 2008, pp. 17 18). Kirkland and Karlin (2017) state that Theatre has a huge variety of gear, which includes an array of playback equipment, wired mics, wi-fi mics, speakers, monitors, amplifiers, and adds to its tools assets for sound reinforcement and playback. Theatre can also assist with Sound Design. A small office/work location is outfitted with a tackle machine & amps; monitors, keyboard station, and tools that effortlessly help with cell recording. Flinn (1998) asserts that Microphones are a principal section in the production of a live performance on the stage as equally as they are in sound reinforcement. In many ways, you would desire to restrict yourself from using microphones at all in the theatre. When microphones are used in theatre, they are used for subtle reinforcement of the theatre sound subtle reinforcement. There are quite a few types of microphones used in theatre sound. Footlight mics, hidden wireless mics, shotgun mics, and boundary mics are often used in the theatre to reinforce without being particularly visible (Flinn, 1998).

Sigismondi (2008) argues that theatres operating with limited budgets often try to minimise the number of microphones used during performances. A common approach is to suspend a few microphones above the stage and place several boundary or floor-mounted microphones at the front of the stage. However, this method presents a number of challenges. These include limited gain before feedback because multiple microphones remain open and are positioned far from the performers, comb filtering which produces a thin and hollow sound when several microphones capture the same actor, increased pickup of stage vibrations, reverberation, and other unwanted noises, and inconsistent sound levels as actors move in and out of the pickup range of

different microphones.

In contrast, professional theatres adopt a different approach to address these problems. Instead of relying on distant microphones, each performer on stage is usually equipped with a wireless microphone. Sigismondi (2008) further notes that many Broadway productions invest over one hundred thousand dollars in wireless microphone systems for a single production. According to Eargle (2012), the fundamental principle of microphone placement in any application is to position the microphone as close as possible to the intended sound source. As a result, performers typically wear small lavalier microphones that are clipped, taped, glued, or sewn onto parts of the face, hair, or costume. This close-miking technique reduces many of the problems associated with distant microphone placement. Because the distance between the microphone and the actor's mouth remains constant, a stable and consistent sound level is maintained. In situations where higher sound levels are required, head-worn microphones may be used to position the microphone even closer to the performer's mouth. In some cases, a few overhead microphones may still be used for minor speaking roles, although this approach requires realistic expectations regarding performance quality.

Fisher Dachs Associates (2004) also indicate that theatre sound and communication systems should incorporate subsystems for both auditorium amplification and production communication. The production sound system generally consists of a fixed network of trunk wiring, receptacles, and equipment designed to support multi-channel speech and music reinforcement as well as playback. This system often follows a left, centre, and right loudspeaker configuration to ensure adequate loudness

and clarity for the audience. Loudspeaker arrays are usually installed above the stage and, in some cases, in other areas of the auditorium. In addition, the system provides audio feeds for onstage monitoring and allows connection with external recording and broadcasting systems. Permanent equipment is typically located in the sound control room and amplifier rack room, while portable devices such as microphones, monitor loudspeakers, and stands are made available for use during productions. Furthermore, many theatre facilities provide archival recording systems, both analogue and digital, to document performances and events.

Engaging the emotions of an audience is essential for sustaining their attention throughout a performance. Different types of sound are often associated with particular moods and emotional responses. The careful combination of music and sound effects can create feelings of suspense, fear, excitement, or celebration. For example, slow musical tempos may evoke sadness, whereas strong rhythmic drum patterns may suggest tension or impending tragedy. The strategic use of music and sound effects at key moments can intensify the mood and enhance the overall atmosphere of a production. Just like other theatrical elements such as writing, acting, directing, and lighting, sound plays a vital role in the success of a theatrical performance. It works together with these elements to engage the audience and immerse them in the dramatic experience. Even on its own, sound remains a crucial technical component of any successful theatre production.

Theoretical Framework

Semiotics Theory

This chapter examines existing literature on theatrical sound production and sound

reinforcement, with particular attention to the role of sound in theatre practice. This chapter also presents the theoretical frameworks that guide the study and clarifies how they relate to the research topic and objectives. By reviewing relevant literature, the chapter highlights the importance of sound in theatrical production and identifies semiotic theory as the principal analytical framework for addressing the research questions and interpreting the collected data.

Totu (2014) explains that the concept of semiotics originates from the Greek words semesion, meaning sign, semainon, referring to the signifier, and semainomenon, which denotes the signified or the meaning conveyed. Semiotics therefore examines the role and function of signs within society, often linking such analysis to psychological processes (Saussure, 1857–1913). Similarly, Barthes (1968) describes semiotics, also known as semiology, as the systematic study of signs. The term itself is derived from the Greek word semeion, meaning sign. Barthes further notes that signs appear in numerous forms in everyday life, including road signs, commercial or public signs, and celebrity images. They also occur in visual forms such as drawings, artworks, and photographs, as well as in verbal and non-verbal expressions such as words, sounds, gestures, and other symbolic representations.

Mingers and Willcocks (2017) describe the domain of semiosis as the process of interaction between humans and non-humans through technologically mediated communication within social, material, and personal environments. In addition, Eco (1976) views semiotics as an independent discipline capable of developing theoretical propositions and generating predictions. Kuzu (2016) further defines semiotics as the scientific study of the structure and functioning of systems of signs and symbols used for communication. In this sense, semiotics provides a framework for analysing and

interpreting various forms of communication, including language, images, traffic signs, sounds, music, advertising, architecture, fashion, literature, paintings, and cartoons (Parsa & Parsa, 2004; Rifat, 1996). Essentially, semiotics encompasses all meaningful structures that shape both social and individual discourse.

Eco (1976) further asserts that semiotics deals with anything that can be understood as a sign. Signs may include spoken or written words, images, sounds, gestures, or physical objects that communicate meaning. Individuals interpret these elements as representations that signify something beyond their immediate form. As a result, semiotics has become a major post-structural analytical approach that examines both verbal and non-verbal signs within different forms of communication. Human interaction is therefore continuously mediated through signs. Andersen (1990) also emphasises that semiotics aims to function as the science of sign systems in the same way that linguistics serves as the science of language. Consequently, semiotics encompasses linguistics while also extending to the study of other symbolic systems.

Another important aspect of semiotic theory is its classification into distinct sub-disciplines that can be examined independently to address specific analytical concerns. Traditionally, semiotics is divided into syntactics, semantics, and pragmatics, which focus respectively on the structure of signs, the meanings they convey, and their practical use in communication. These divisions reflect the philosophical foundations of the discipline (Stamper, 1993). From these perspectives, semiotics involves examining linguistic and cultural signs and understanding how they generate meaning within a particular text. In this context, a text may take various forms such as sound, visual images, spoken language, or a combination of these elements. For semioticians, these signs must carry cultural relevance in order to produce meaning. Rose (2001)

argues that semiology provides a comprehensive set of analytical tools that allow researchers to deconstruct visual images and understand how they operate within broader systems of meaning.

Isfandiyary (2017) states that a Semiotic is a science that learns the sign, object, and its meaning, and in semiotics, there are the signifier and the signified. The *signifier* refers to the form that a sign takes, whereas the *signified* denotes the meaning or concept to which the sign refers. Generally, semiotics is the finding out about signs and symptoms or an epistemology about the existence or the reality of signals in societal life. Semiotics studies the production, transmission, and interpretation of meaning represented symbolically in signs and messages, primarily but not exclusively in language.

Elam suggested provocatively in 1964 that the theatre, marked by a real informational polyphony' and a density of signs', constituted a privileged field of semiotic investigation: 'the nature of the theatrical sign, whether analogical, symbolic or conventional, the denotation and connotation of the message and all these fundamental problems of semiology are present in the theatre' (Elam, 2002 p.18).

According to Pavis, theatre semiotics may very well be on the threshold of a new synthesis, not only bridging the gap between theory and practice but also between science and art, between rationality and mysticism. Semiotics talks about theatrical performance in terms of signal systems. A signal system is a cluster of signs and significant elements, without end, referring to something else and producing meaning.

Mertz (2013) avers that on the fantastic side, semiotic studies in anthropology have discovered increasingly creative methods to hint at the linkages between the micro-

level small print of nearby interactions and macro-level trends attaining national and worldwide arenas. Concepts like “footing” and “entextualisation,” studies of the interaction of overall performance and audience, and research on voicing in its social context. According to Foster (2017), Bignell (2002), and van Leeuwen (2005), through dynamic interactions, signs such as sounds, images, spoken words, and multimodal combinations collectively convey meaning within a specific context, generating meaning through their interrelatedness. Newton (2015) postulates that much present-day research significantly interprets and contextualises matters from a variety of musical eras and styles, which includes sound. However, analysing theatre productions presents sound students with a new set of troubles because the theatre production medium no longer solely consists of visual signs in the structure of the image track, but additionally some other class of sonic symptoms in the shape of sound production. With iconic signs, traditional sound design, and Onomatopoeia being seen as a thing of sound design, music affords clues for the perception of visuals or narrative. Under this category, the sound is analysed into how the exceptional parameters of sound (volume, reverb, equalisation, panning) and onomatopoeia convey specific signs for the duration of the production. Schweitzer (2004) states that semiotics theory tends to elude the issues of sound in theatre productions and either regulates sound to a minor status or even ignores the issue completely. He further adds that the semiotic approach towards this medium can reveal crucial information not only on how a theatrical production is structured and conceptualised but also on how this structure works in terms of influencing the audience. Zakia and Nadin (1987) explain that a sign may be regarded as anything capable of communicating meaning. From this viewpoint, elements such as words, images, music, smell, taste, sound, painting, sculpture, architecture, film, video, dance, mime, and gestures can all function as signs once they

are interpreted within a particular context. Similarly, Chandler (2007) emphasizes the need to clearly define the meaning and scope of signs, noting that they may take many forms, including drawings, paintings, photographs, spoken or written language, sounds, and body language. He further explains that the wide range of subjects addressed by semiotics, as well as its interdisciplinary nature, has generated considerable debate among scholars about what should properly fall within its field of study.

Merer et al. (2008) note that semiotics has been applied in various research contexts, including music information retrieval, the perception of impact sounds, noise annoyance studies, sound design, and the perception and cognition of romantic music. Valle (2015) further explains that audible agents often appear primarily through mechanical processes. According to Valle, establishing a semiotic theory of sound alone is challenging because sound itself cannot easily be defined within the epistemological framework of semiotics. Conversely, while a semiotic theory of listening may provide insight into listening as a cultural activity, it does not adequately address the nature of the sound object involved in that process. Consequently, Valle suggests that a structural relationship between the perceiving subject and the sound object is necessary.

Capeller (2018) explains that audio signals serve as representations of sound but lack a formally codified relationship among themselves. As sin-signs, these reproduced sounds guide the auditory field toward what semiotics describes as secondness. This occurs because reproduced sounds are often perceived as imagined duplicates that point to an assumed real source or cause from which they originate.Zantides (2012) states that sound can have a hidden impact on interpretation. It may transform into a

visual form but with a different signified than its acoustical. An image might have unlimited interpretations, but in relation to text and sound, it can be limited to the intention of the maker or the free interpretation of the viewer. According to Jekosch (2005), the Sound plan constructs the audibility of the world. Sounds carry records about the world. This means when listening to sounds, communication takes place. These characteristics are common to speech sounds and are equally relevant to other forms of sound, including music tracks and sounds employed in theatrical productions. In principle, every acoustic/theatrical event can be perceived as a signal service through which things about the world are communicated. In its remaining sense, sound helps in conveying the message of the theatre performance to the audience. To be successful, sound designers have to make sketch choices on the groundwork of how audiences perceive sounds and what sort of communication takes place in the course of this event. A suitable sound sketch requires a distinctive view of acoustic/auditory communication. Among different sciences, semiotics deals with this field.

In conclusion, this chapter reviewed relevant literature on theatrical sound production and sound reinforcement, highlighting the central role of sound in theatre practice. The discussion of theoretical frameworks demonstrated their relevance to the study's objectives, with semiotic theory proving particularly effective in guiding the analysis. Through this framework, the researcher was able to interpret the research questions and meaningfully analyse the data collected for the study.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents a discussion of the various approaches the researcher employed in gathering information for the study. The data involves the suitability or otherwise of the Amu Theatre and its facilities for productions in terms of sound production. This was done by examining both structures, considering their technical benefits for productions and the need for general sound reinforcement in the Department of Theatre Arts. The study employed the qualitative research approach, which further informed the researcher as to the type of primary and secondary data needed for this study. The research employed these approaches to secure adequate data for the analysis and to ensure that the objectives of the study were properly substantiated as regards theatre sound production in the Department of Theatre Arts, University of Education, Winneba. This was to enable the researcher to establish reliable data, which eventually informed the recommendations the researcher would give. The primary data focused on the information the study gathered through personal observations in the Department, in-depth interviews with some individuals and others who had the technical know-how and interest in theatre, and finally, the researcher examined the facility with some productions which were staged in the facility including The King Must Dance Naked, The Adventure of Sasa and Esi, Ananse in the Lands of Idiots and The Birth of the Mystery Child. The study, therefore, used these stage productions as the basis for analysing the issue of sound production. This, in effect, helped the researcher to envisage how these productions mounted were affected by the issue of sound during the performances.

The secondary data concentrated on journals, books, articles, internet sources, and other relevant documents. This chapter will therefore focus on the following: research design,

population for the study, sampling technique, sample size, data collection instruments, types of data, administration of instruments, data collection procedures, and data analysis plan.

Research Approach

This study was situated within the qualitative research approach. Agyedu et al. (2013) affirm that this approach offers several traditions and is effective in obtaining culturally specific information about the values, opinions, behaviours, and social context of particular populations. This method was appropriate because the study required information that could be derived from people well-rooted in theatre practice and who are familiar with theatrical productions and the facilities involved. Rudestam and Newton (1992) attest that "qualitative implies that data are in the form of words as opposed to numbers" (pp. 29-31). From the above statement, the qualitative method was used for grasping subtle shades of meaning and for pulling together divergent information on the theatrical sound production, and this research dwelt much on the information gathered from the interviewee and observations to get adequate and accurate data for the research. Denzin and Lincoln (2000) also posit that qualitative research involves the adoption of an interpretive and naturalistic approach to research. This means that qualitative researchers "study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them" (p.3). In the same manner, the data was collected based on participants' own experiences and opinions and devoid of manipulations since qualitative research places a premium on and prioritises the voice of participants in the research process.

Research Design

According to Gay (1996), a research design describes the basic structure of the study,

indicating the nature of the variables and the constraints of the ‘real world. Creswell (2014) also establishes that the research design can be described as a strategy, plan, and structure for conducting a research project. In furtherance, he argues that the selection of a research design is mostly dependent on the nature of the research problem being addressed, the researcher's‟ personal experiences, and the audience for the study. Given these definitions above, this research adopted the case study design based on the nature of the topic and the participants of the study. The case study research design allows the researcher to meet the purpose of the research. The researcher used this framework to collect and analyse the data needed to answer the questions in this study. In addition, the design was based on the case study, which helped examine behaviours and situations separately, and the researcher engaged in interviews, observations, and field reports as an integral part of the whole study.

Population

The population is the collection of all individuals or units that a researcher would like to study (O’Gorman & Macintosh, 2014). The universe of research, according to Kumekpor, as quoted by Kwakye-Opong (2011), is the total number of all units that are available to be investigated (P. 60). This involves objects, individuals, facilities, and experiences with similar features and purposes. Based on this statement, the study investigated matters focusing on sound production during staged productions. The interview covered experts who in one way or the other had something to do with theatrical productions and the facilities, thereby delving into management, workers, theatre practitioners, performing arts lecturers, theatre students, and public patrons, on the whole, to be reliably informed on how theatrical facilities and the facilities have presented themselves suitable for theatrical productions with the focus on sound. The

population of this study was grouped into two: primary and secondary respondents. The primary was categorised into three groups, with each set or category made up of groups of individuals in a common department or unit. The secondary respondents formed just one set. Below is the arrangement.

SET	POSITION OF RESPONDENTS
A	Development Officers
B	Performers
C	Technical Instructors
D	Audiences

Figure 1: *Schematic Overview of the population*

The above table is interpreted as follows: sets 'A', 'B', and 'C' constitute the primary respondents, and the last set 'D' represents the secondary respondents. Set 'A' has respondents from the University's development unit. Set 'B' has respondents who are performers. Set 'C' also has respondents as technical persons from the Department of Theatre Arts. Lastly, set 'D' (secondary respondents) is made up of respondents who patronise productions in the Department of Theatre Arts.

Sampling

According to Mugenda & Mugenda (2008), sampling is a group or subgroup that is obtained from the population that a researcher wishes to study. Kumekpor (2002) also defines sampling as "the use of definite procedures in the selection of a part for the express purposes of obtaining from its description or estimates certain properties and characteristics of the whole" (p.132). Sampling made it possible for the researcher to

narrow the study to a relatively small portion of the selected people.

Sampling Technique

The researcher considered the use of a non-probability sampling type and employed the purposive sampling technique. The sampling strategy directs researchers to know whom to observe or whom to interview (Lindlof & Taylor, 2002). The study used this technique because, in securing data, the study needed respondents who were knowledgeable in theatre. The universe or population, therefore, brought together the possible respondents purposively selected for the investigation. Though the population was gathered through the purposive sampling technique, the respondents within the various sets considered for the interview were different in terms of departments and units. Thus, the grouping was done such that each set was made up of individual experts with the technical know-how in a specific area.

The reasons which informed the groupings are as follows: the first category, which is set 'A', brought together some members of the development unit of the university (the directors and the architects). What informed this category was that the study needed information on how the designs of the facilities were informed, their purposes, objectives, missions, and what exactly the theatre facilities comprised.

The second group, set 'B', was made up of the actors, stage managers, and directors of the productions mentioned earlier in chapter one: The King must Dance Naked, The Birth of the Mystery Child, The Adventures of Sasa and Esi and Ananse in the Land of Idiots, which were staged in the department. It was important to create this group because the researcher wanted to find out from the group and to establish the capabilities of these facilities for productions, their challenges with sound, as well as

the types of basic equipment available for sound production in the facility, and how the staged productions mentioned above were affected.

The third category, which was set 'C', comprises the technical instructors and persons in the departments who oversee technical issues during productions in the department. For any conventional theatre facilities to be conducive for productions, technical issues such as sound and light are indispensable; therefore, this research would have been incomplete if the researcher failed to investigate the technical issues of the performance facilities in the School of Creative Arts, which forms the basis of this research. This group informed the study about the functional equipment the theatre department and theatre facilities have, and the ones that need replacement or repairs.

The last category, set 'D', was made up of individuals who are witnesses to the performances staged in the Department. This group is made up of persons who frequently visit the Department whenever there are theatrical productions. It is important to point out that the creation of the purposive categories was extremely necessary because the researcher realised that, technically, greater attention needed to be focused on sound production as a key enhancement to art exhibitions. Written literature and documentation on the facility in terms of the technical theatre were very minimal, especially in the area of sound production. There was no extensive information properly documented to resort to on the Amu Theatre and as a structure. Finding documented data on past and present activities and projects the theatre had embarked upon concerning sound production was a challenge. Therefore, the interview sections became very essential to reinforce the data gathered for the research.

Sample Size

Wimmer and Dominick (2006) argue that "qualitative research projects use small

samples that eliminate a researcher's ability to generalise the results to the population." They further suggest that for a sample size of 6 to 12 sample size is ideal (pp.116 & 128). The sample consists of respondents grouped under A, B, C, and D, which are translated as A for the development officers representing 2 respondents. B for the set of actors, stage managers, and directors from four different productions, and had 4 groups of respondents. Group C stood for the technical instructors and persons in the departments and had 4 respondents, and the last group, which is D, had 4 respondents. It is therefore important to explain that the study had 14 respondents for this research since the study employed the qualitative research method.

Data Collection Instruments

The instruments for collecting data were carefully chosen to be used in this research to suit the qualitative approach. The data collection instruments for this study were a well-reviewed set of questions that helped the researcher interview the selected sample size to get answers that were valuable to the research. The researcher also employed observation and group discussion as an instrument for the study.

Interviews

Wimmer and Dominick (2006) posit that "interviewing, is a research strategy for understanding audience attitude and behaviour […] the people possess certain characteristics and are recruited to share a common quality or characteristics of interest to the researcher," (P.128). Therefore, to arrive at a more reliable data and knowledge which would enrich this research, the study employed the interview technique. Wimmer and Dominick (2006) assert that; "qualitative research uses a flexible questioning approach. Although a basic set of questions is designed to start the project, the

researcher can change questions or ask follow-up questions at any time." (P.116). To this end, the study employed the semi-structured interview style. This style was chosen because the researcher needed some flexibility in the process of questioning and answering. This was to enable the interviewer to go beyond the guide, if necessary, as against the structured style, which, according to Kumekpor (2002), "imposes an external indirect discipline on the interviewer to go straight to the subject matter and discuss only issues related to the subject under investigation." (p.188). More so, the researcher did not use an unstructured interview style to enable the researcher to have control, whereas the respondents would not be allowed to go beyond limits by talking about general issues. Consequently, interviewing the technical persons in the department, the development officers, and the actors, stage managers, directors, and the audience, which constituted a sub-section of the experts, became the most appropriate thing to do. This provided an opportunity and the environment for the study to concentrate on materials and facts that had been abandoned, situations that had been overlooked, and problems that were long overdue to be solved. The objectives and the method of collecting data for this research also influenced the research. The interviews conducted for this research were carried out on a one-on-one basis and, with the interviewees' consent, recorded and transcribed. The recording device the researcher used in gathering the data was an audio recorder.

Observation

DeWalt and DeWalt (2002), as stated by Kawulich (2005), believe that "the goal for the design of research using participant observation as a method is to develop a holistic understanding of the phenomena under study that is as objective and accurate as possible given the limitations of the method" (p.92). They suggest that participant observation be used as a way to increase the validity of the study, as observations may

help the researcher have a better understanding of the context and phenomenon under study. Validity is stronger with the use of additional strategies used with observation, such as interviewing, document analysis, surveys, questionnaires, or other quantitative methods. The researcher employed the use of participant observation as an instrument for data collection, which helped elicit information from respondents concerning how they go about sound during productions in the department.

Group Discussions

According to Casey and Krueger (2000), group discussion provides "a more natural environment than that of the individual interview because participants are influenced by others just as they are in real life" (p.11). The group discussion method was used in the research to obtain information from the respondents and relevant participants, for whom the issues were relevant. A group discussion was organised for respondent 'B' for various staged productions as mentioned above. These people comprise performers, stage managers, and directors who were regular in the productions mentioned earlier. These people were selected because of their knowledge, roles, and contributions to the productions. The group discussions provided participants with a space to discuss a particular topic in a context where people are allowed to agree or disagree with each other.

Types of Data

The primary data for this study took the form of audio recordings for most of the interviews, video coverage, and photographs during some productions through participant observation in the facility, including the building and facilities, and the machinery available. The secondary data were, however, collected through sources such as published books and articles, unpublished theses, and other kinds of documents.

Books on the history of theatrical sound design in films and television, sound design in theatre, and the importance of sound in theatre, exploring the theatre of sounds, and many more. These documents on theatre sound gave insight into theatre facilities and the integral role sound plays in theatre productions. With these records, actual occurrences about the theatre facility were set straight with interviews conducted with people who are living witnesses to the establishment and use of these facilities.

Administration of Instruments

When the researcher identified the specific and various respondents he wanted to interview, they were grouped into sets, and an action plan was designed to follow, thus, when and how routines should be followed. The first meeting arrangement the researcher made with respondents was to introduce himself, his intentions, and what he was about. He used the opportunity to give out the interview guides, and this was to enable them to prepare for the forthcoming interviews. The interview guides were of four different types, designed for each group of respondents depending on what information the study needed from them.

Data Collection Procedures

The data collection procedure looks at the various steps, ways, and means Through which the researcher applied the various data collection instruments to gather Data for the research study (Asiamah, 2017).

Interview

To gather data for this research, the interview guide was designed, and interviewees were selected. Based on the selection, the arrangement was done in advance at the convenience of the interviewees by calling some of them and also visiting some of them physically to arrange a time to meet. The participants for the research interview were

visited, and interviews were organised depending on each participant's convenient time. Interviews were one-on-one with various respondents and took place on campus and at the various offices of some respondents. Very little information was received and clarified over the telephone. Many of the respondents availed themselves within the specified period, but a few delayed the process due to the coronavirus pandemic; therefore, some sets took almost a week to complete instead of the proposed schedule. Respondents in Set 'B' and 'D' became the pioneers of the whole process, and that took a long time. Set 'A' and 'C' followed suit. Respondents were asked to prepare for the interview, telling them the areas to be discussed before the said dates for the one-on-one interviews. The interviewer and the respondents agreed on two dates scheduled for the one-on-one interview to take place, based on the respondent's availability and readiness. As stated earlier, respondents were given time to prepare for the interview before the actual interviews were scheduled. The reason why the researcher requested two dates was precautionary; thus, if a respondent is not able to honour the first appointment, then the interviewer would have another opportunity to make sure he meets the person on the second appointment date.

The interviews were done in a well-relaxed state, and the flexible nature of the interview guides also allowed some of the respondents to go beyond the guide, and this drew the interviewer's attention to very pertinent issues about the production facilities. For clarity and confirmation of data, all relevant issues that came up during the interview sections were considered very important. In general, many of my respondents were available, and the researcher received the information the study was seeking. For convenience's sake, most of the interviews were recorded and played back after the interviews for documentation, and this method was adopted because asking questions, listening, and writing at the same time was not ideal for this style of interview, as it

distracts the conversation. More so, it would have required a lot of time, and since these respondents had equally important activities to attend to, it was prudent to record instead. Also, this was done to have the whole conversation as a backup. The use of the recorder enabled the researcher to follow the interviews and ask questions appropriately, and this also helped the whole process to be faster and more relaxing. Approximately the entire collection took one month to complete.

Observation

Information was obtained through participant observation, which became one of the important survey instruments used to solicit data by the researcher during the pre-productions, the main productions, and the post-productions periods. The researcher took time to observe students during their audition periods for various productions to help the researcher see how people are selected and given a role in sound production. The researcher observed students in the technical units setting up for variations in the department. The researcher observed keenly all the activities and performances that were displayed by immersing himself fully in all the activities. The researcher recorded everything that was seen and heard during the various setting-up sessions and took field notes during the observational periods, and recorded the behaviour and actions of the participants as well as other events as they unfolded. This was later transferred into a bigger book, which the researcher termed ‘My ethnographic field notebook’. The researcher used the writing notepad concurrently with his Tecno LA7 phone. At points where it was too obvious to use the writing pad, the researcher resorted to the phone as a way to keep the eyes of the participants away from him. The field notes were sometimes taken intermittently during periods when the productions had reached their peak. This was done in order not to raise the attention of the participants or distract

them from the activities in session. It was also to prevent them from having the impression that their every move and action was being monitored and recorded, as this would have caused them to fidget and act in an unnatural way, which would have affected the findings of the study. Of course, the recordings were done with the consent of the production's coordinator. The researcher actively took part in almost all the activities, and that was to help the researcher familiarise himself with the people and also to experience in full the participants' ways of doing things and their understanding of things from their perspective within the area of theatrical sound production. During the observational process, attention was also particularly paid to events as they unfolded by observing the audience who came to watch some productions. Activities and events were observed and recorded to discover how people felt and whether there were any commonalities between trends and patterns of behaviour. Also, what people said, the words they used, and the accounts and explanations they gave for their behaviour were all taken into account. The researcher also took note of comments and suggestions that were raised and discussed during the post-mortem. This method was used to assess the authenticity of some of the data that the researcher gathered through other methods.

Group Discussions

As explained above, group discussions provide participants with a space to discuss a particular topic in a context where people are allowed to agree or disagree with each other. The researcher arranged and met the respondents on the 25th of March, 2020, at 3 pm. The discussion took place on campus in the SCA mirror room, and it took an hour and forty-five minutes to finish the discussion. The respondents took turns to contribute to the discussion, and it was noted by the researcher that the response rate was very high and the information was clearer. The group was more rewarding. This

was because the respondents felt safe and comfortable being in a group of people they knew very well. They felt more relaxed and welcomed to talk. More so, they got the opportunity to elaborate on their opinions and sometimes demonstrate some of the theatrical elements in sound. The range of responses was widened. The group discussion done in this research also activated forgotten details from earlier held interviews and also released inhibitions of the participants.

Trustworthiness

Lincoln and Guba (2000) emphasize that establishing trustworthiness in research is essential for ensuring the credibility of a study. In this regard, Anney (2014) recommends that qualitative researchers apply the criteria of credibility, transferability (external validity), dependability (internal validity), and confirmability, as proposed by Lincoln and Guba, when conducting their investigations.

In line with these principles, the present study employed participant observation, interviews, and group discussions as data collection techniques to achieve triangulation. This approach supports the view of Riemer (2008), who argues that ethnographers should utilise multiple sources of data and diverse collection methods to enhance the validity and trustworthiness of their findings.

Furthermore, the study was guided by a multi-theoretical framework that incorporated gender performance theory, identity negotiation theory, and communication theory of identity. The research process was carried out objectively and subjected to peer review to maintain scholarly rigour. In addition, a thick description of the phenomenon under investigation was provided, following the approach advocated by Geertz (1973) as cited in Daymon and Holloway (2011). Finally, the themes that emerged in the analysis were

developed from codes generated during the data analysis process.

Data Analysis Plan

The study explored several issues that emerged during the collection of both primary and secondary data. Information obtained from secondary sources was supported and complemented by the primary data gathered from respondents. The research employed thematic analysis, through which patterns were identified and themes were developed from the interviews and discussions conducted by the researcher.

The collected data were transcribed and systematically analysed in relation to the study's stated objectives in order to reach a reliable conclusion regarding the effectiveness of sound production in the Department of Theatre Arts at the University of Education, Winneba, during staged performances. In addition, the study examined whether the theatre facilities were adequate from administrative, artistic (structural), and technical (equipment) perspectives for theatrical productions, or whether they were more appropriate for certain types of productions than others. Given that theatre spaces often serve different functions, some level of variation in their suitability was anticipated.

The findings obtained from the analysis were subsequently used to address the problem statement and the research questions of the study. These issues are further discussed in the following chapter, which focuses on the analysis and interpretation of the data collected for this research.

CHAPTER FOUR

FINDINGS AND ANALYSIS

Introduction

This chapter presents detailed discussions of findings from the data collected through interviews, participant observation, and group discussions on theatrical sound production in the Department of Theatre Arts at the University of Education, Winneba. This chapter will be analysed under the various group sections and will be the presentation of statistics gathered from respondents beneath the categorisation of development officers, which represent group A, Performers for group B, technical instructors for group C, and the secondary respondents, which is group D. The researcher will present facts amassed from the various respondents. This will then be supported by the additional facts gathered, as well as the researchers' observations and participation in productions mounted in the theatre space. In this instance, the researcher would talk about how the productions fared in the theatre facility in connection with sound production. It is important to state that the researcher transcribed the data collected from the respondents, focusing on the findings and word-for-word reporting. This decision was informed by the realisation that respondents, in most cases, presented different ideas and responses. Also, the respondents sampled for this study had various knowledge and ideas; therefore, transcribing their views word-for-word also might go a long way to clarify issues. For easy analysis and interpretation, the data derived were simplified into several thematic units. Each theme was thoroughly described and critically analysed using the semiotic theory and the literature reviewed in Chapter 2. Technical issues with sound to complement creativity are always critical, and this study will be incomplete if the researcher fails to analyse these theatre facilities technically.

For anonymity and confidentiality, informants were represented with alphanumeric codes, such as (Informant1), in various groups. Below are the research questions that underpinned the data collection.

1. How relevant is sound reinforcement to sound production in the Department?
2. What are the basic processes involved in theatrical sound production?
3. How can sound production be improved during productions in the Department of Theatre Arts?

RQ 1. How relevant is sound reinforcement to sound production in the Department?

Sound has been an integral constituent of the experience of theatre; it has been peripheral and subordinate to the text, body, and spectacle in theatre. Shrinkhla (2009) affirms that the core of theatre is typically the sensational content, the entertainer's body, or the visual scene. Sound in the performance centre can be voice, music, or audio cues. Much of the time, sound in theatre works as a helper that increases the impact or stresses the core of the content, body, or exhibition. In this sense, it plays a subordinate and supporting role to the focal occasion in the theatre.

According to Davis and Jones (1989), recreating sounds on stage that are needed to enhance the audience's understanding and enjoyment of the play is called sound reinforcement.

Scott (1996) explains that a sound reinforcement system consists of a combination of microphones, signal processors, amplifiers, and loudspeakers housed in enclosures, all operated through a mixing console. This system is used to amplify live or recorded sounds and distribute them to a wider or more distant audience. In many cases, sound reinforcement systems are not only used to increase volume but also to improve or

modify the sound produced on stage. This is often achieved through the use of electronic effects, such as reverberation, rather than merely amplifying the sound without alteration.

From the above, sound reinforcement is when you make something louder, and you also shape the sound, so what the audience hears reinforces what's happening on stage. There are four types of devices or sound reinforcement systems that work together to create a simple sound**.**

Kirkland and Karlin (2017) state that the theatre has a wide range of equipment, including a range of playback devices, wired microphones, Wi-Fi microphones, speakers, monitors, and amplifiers, expanding the advantages of its sound reinforcement and reproduction tools. This reinforcement system is simplified into input, processing, amplification, and output. In short, we can say the components of sound reinforcement are the Mixing Console, Signal Processors, Sources, Cables, Amplification, and Speakers.

Sound production is a very essential element in Theatrical productions. Dance, Musical opera, and Drama are the main arms of Theatre, and none of these can be complete without the services of sound production.

Sound amplification in the Department of Theatre Arts will be very beneficial to the students and the various productions in general. Kendrick and Roesner (2011) are candid in suggesting that sound has always been with us; Indeed, all of nature is a product of sound, and harnessing sound for effective use is what theatre is, even the sound of silence. Sound production or sound forms an integral part of theatre production as it can add meaning and establish mood and atmosphere to theatrical productions. Reinforcing sound will help sound production gain ground and improve in terms of

quality, and it will also equip students to gain knowledge concerning sound production.

The Department of Theatre Arts, in its power, leaves no business of Theatrical sound productions behind, sound as a key component of Theatre. Sound creates atmosphere and mood in performances. In modern Theatre, sound production has been taken to an ultra-standard where the programming of sounds is made automatically in accordance with well-rehearsed performances, such that a sound operator is not even required during performances. With this, looking at how sound is produced in the making of Theatre in the Department, there is a long way to go to reach such ultra-modern standards. Burkart (2008) states that when we venture from the basic principle of sound, we can observe the production and technical practices that help take these sounds and connect them to the controlled world of the target audience. There is the normal and old way of producing sound, where sound designers have to carry loudspeakers to and from each day to the rehearsal grounds and operate with their computers. Also, there is no allocated computer for sound production during the Theatre production process. Moreover, Foley artistry is one of the most challenging yet exciting in the making of sound for Theatre, and in this Department, students seem to fish out every sound from the internet, but this is a big art that should be much encouraged to bring out some outstanding talents in students and from students.

Sound reinforcement will see to it that audibility in the Theatre is well improved and is levelled at the ultra-modern standards. Finelli (2012) speaks of the need to continue to rethink the history of theatre and to reassess the theory and critique of performance from the perspective of hearing, to understand the traditional dimensions of voice and other actors involved in the transmission and recording of sound, and to address. Often than not, voices need to be clear where we have other special effects sounds introduced.

Each sound that one produces on stage is designated for a particular role. So, you have read the script, which gives you the demands of the production in its technical form, and sound, as said earlier, synergises with other elements, such as light. So, when setting up for sound, you should have read the script to see if it is sound to promote an idea or sound for a special effect; it does not just want to create a certain atmosphere, combining sound and light to create that atmosphere. Hence, it is important to get your script there.

The environment, the theatre as the performance facility, and the space in the performance facility where the performance will take place will help in performing the sound exercise, knowing the size of the space, will guide you as to the quantity or number of equipment to use as far as a speaker to human ratio is a concern, your console, microphones, as well as the demand of the production, how many artists or actors are going to be on the production so that you will have to look at several microphones, body microphones, or some Phantom microphones that will be used. According to Kaye and LeBrecht (2009), in contemporary theatre, the microphone has assumed a role similar to that of the mask in ancient Greek theatre. It functions as a tool that simultaneously creates intimacy and distance, while both concealing and projecting the performer. In this sense, the microphone serves as both a protective barrier and a medium through which the performer is continuously exposed to the audience. One should consider the various spots that the artist or actors would stand to perform as a key important thing; some spots would need more intensive audio assistance, like microphones, and some will need some other devices, then look at the closeness of the auditorium. First seats to the apron to the stage there again, regarding the School of Creative Arts theatre, the theatre was not designed with sound in mind, so where to even place and position some audio machines and equipment like speakers is a problem

when speakers are positioned in front of the proscenium arch on the wink site, it disturbs those seated in the front row because there are quite closed spaces between the stage and the audience on the first row, that is to say, the front of the stage.

Figure 1: *The space between the stage and the first seats in the SCA theatre*

Source: From Researcher's Field Notes

Khoury et al (1998) establish that optimising the output array positioning and sound processing for each performance in the theatre is challenging. But ideally, the sound should be flown. This means it should be rigged, there should be trusses on which the boxes can be fixed, and that is internationally accepted because, by standard practice, speaker boxes should be flown to give clarity and travel distance for the sound to spread out as it leaves the stage into the audience. But in the theatres, the sound is positioned right on stage facing the audience, and the impact is too much for the audience sitting in the front. But sound should be more surrounding, making sure sound gets to everyone in the theatre, taking into consideration the back rows. That is why the architecture of the building should consider sound production.

A respondent stated that:

> *Performance spaces are supposed to have a tiered seating arrangement so that sound can go beyond the front to feed the middle and the rear. That is why I think sound output gadgets are not supposed to be mounted on a stage, or some particular equipment is employed to help increase sound effects (Respondent C).*

Top-quality loudspeakers and good sound processors will produce very high-quality sounds, which will serve the purpose of sound production in the Department of Theatre Arts.

A respondent stated:

> *In theatre productions, sound enhances understanding. Some of the sounds I heard prompted me to engage in dialogue and helped me interpret the meaning of the performance. For example, the use of house music or thematic sounds provided clues about what was going to happen (Respondent B).*

Further interactions with the respondent established that actors want viewers to perceive sometimes more important than what the viewer sees, because emotions are hard to convey only with visuals. The respondent also added that precise music or sound effects with quality sound output levels can make the audience feel whichever emotion the production requires the viewers to feel. In adding up to the statement, the interviewee asserted:

> *We just need to have the equipment and probably what we can use to produce the needed sounds. I think it would be better for us to have microphones and other devices that can help us reach where the audience is seated. We have a large audience, so we also need sound accessories to be able to reach them and for those backstage to help them hear from the stage (respondent B).*

In looking at the relevance of theatrical sound reinforcement during productions, it should begin from the creation, not just the implementation.

If we talk of sound in a theatrical setting, the sound is one of the key theatrical elements that cannot be done away with. Because in theatre, the audience is supposed to see, they are supposed to hear, they are supposed to feel, that is, see, hear, feel. And if they do not see, they cannot hear; if they cannot hear, they cannot see.

A respondent declared:

> *In the theatre, all the senses must be engaged. Sound, in particular, plays a major role in everyday life. Even outside the theatre, being unable to hear presents a significant challenge, as it restricts participation in essential activities. Just as visual impairment limits engagement with the world, hearing impairment can make a person feel disconnected from society and from what is happening around them (Respondent C).*

Now, if sound is removed from theatrical activity, it is as if the audience is "blind," deprived of a critical means of perception. Sound in theatre is not merely about hearing—it is about understanding and interpretation. The purpose of sound extends beyond allowing the audience to hear dialogue, songs in an opera, or traditional instruments; it is also to enhance comprehension and convey meaning. In this sense, sound functions as both an auditory and interpretive tool, carefully employed to guide the audience's experience and support the narrative, ensuring that specific sounds or musical cues contribute to the overall understanding of the performance. So, if the sound is used in a theatre, it has to be in two forms: sound for the auditorium and sound for the stage. The Theatre audiences will refer to such sound for the auditorium as House Music. Because the theatre is divided into two operational areas, here we are

looking at the auditorium and the stage. And before any production can ensue, you need to hold the audience either in the lobby, the foyer, or get the audience into the auditorium. Now, when the audience is in the auditorium, and you do not engage them, they become or begin to be jittery. It is like their sense of concentration goes, so there is a need to keep them in check by providing house music that will enliven the atmosphere to calm their minds. Some people in the theatre will not use house music to sustain the interest of the audience; they would rather play commercials, or they will play back the production, or they will play back certain activities behind the scenes just to sustain the interest of the audience. Sound is used in two forms, one as house music to sustain the interest of the audience at the particular production, whilst waiting for the kittens to open. Then the other side is for effects, special effects, playback of certain tunes, certain sounds like the doorbell, like a car horn, and these can be done without using a fiscal sound configuration. One can say Tin-ton, like knocking, because theatre is the mirror and theatre is the playback of a real-life situation. From the interview, a respondent:

> *Theatre is an illusion of real life. So, some people try to be realistic. Some directors or some designers try to be naturalistic. So, it depends on the style that you are using. If the director is using the style of naturalism, you would want to ensure that whatever action takes place on stage will be natural. Like in a given circumstance, in the Avengers of Sasa and Esi, I wanted certain elements, and I wanted certain visual elements like properties. So, I brought in real pawpaw to be pilled on stage because I am a naturalist. I brought in a dog, which was property. Because I am a realist. I brought in the pawpaw tree. Because I am a naturalist. I brought a backdrop that created scenery or setting a forest setting because I am a realist, so the setting is realistic. So, they want to hear the sound of an engine idling at the turn. And all these sounds go to enhance the production, and the theatre itself is a collaborative project. This person brings his expertise, and that person brings his*

> *expertise, and is niched or put together to produce a certain outcome, so the sound is very important. It enhances the production or play, it gives meaning to the production or play, it gives a better interpretation to the production or play, it defines the action of the play, defines the location of the play, defines the atmosphere of the play, and it gives you the setting (respondent C).*

Clarification on using sound to define a production setting was established. For instance, if there is a market scene, and people are talking and selling their things, the sounds they make help to define the scope of the setting. So even if a blind person comes to the theatre, he or she can use the audio heard as a helping aid to establish that the scene is a market scene. In that regard, we will say the sound is very important. It has been indicated that sound can be used from a dualistic point of view to serve the auditorium as house music to sustain the interest and to engage the audience so that they do not become jittery. And also, the sound is used by the production to emphasise or underscore or to bring meaning or explain certain stage businesses.

As indicated earlier, if sound amplification is not good, then audiences will find it difficult to hear and understand the production in this context. Playing of sounds has to be neat because the theatre is a mirror of real-life situations. So, if one cannot get the real-life situation from the stage as he or she watches, why won't the person go stand outside and watch cars pass, watch people fighting, or watch market women sell? But because the person wants to ensure that everything that is done in the real world can be captured on stage for him or her to see at a particular point in time, over a certain space, that is why he or she is there to pay and watch. That audience does not need to walk from here to Jamestown to see people fighting. He or she does not need to go to a supermarket to find people selling things. The audience does not need to go to the beach or seashore to see people catching fish. But somebody has written a script and has

contained activities within two hours for an audience to come and watch. Now, they will rather create their dialogue if the sound quality is bad, and they cannot hear, people will complain, disturb those watching, or start chuckling. They will not understand because when you watch a production, you are supposed to do an interpretation. Your sensibilities have to be worked out because it is not about just viewing, but it is about education, information, and entertainment, and these are the functions of the theatre: to entertain, educate, and inform. Listening to one respondent, she avowed:

> *If an audience member cannot hear what is happening on stage, the purpose of attending the theatre is undermined. Except in rare cases—such as symbolic, experimental, or highly stylised theatrical forms where silence is intentional—audiences are generally expected to hear spoken dialogue and other stage sounds. Sound must therefore align with physical action and stage business, working together to create meaning. When sound and action are disconnected, audience engagement is disrupted; viewers may become distracted or disengaged. Effective theatre requires the integration of sound, movement, and visual elements so that they collectively stimulate the audience's senses and deepen understanding of the performance (Respondent D).*

If the sound is not clear, it will be at a disadvantage when it comes to interpretation. Just like you are watching television and you are not hearing the sound. You are seeing the pictures. Maybe there was a gunshot, but the gun was not composed; the gunshot was off-screen. What happened to the presenter? You did not hear, just saw the person fainted, but there was a gunshot. So, it is very important to sound and sound amplification in the theatre makes you understand because it communicates. We do not just say we are depending solely on sound. We use gestures, we use facial expressions, and we use dialogue. But if you do not use sound, you are limiting the communication parameters.

The state of sound production in the department of Theatre Arts has been a bit of a challenge as far as getting the equipment for sound production and playing back sound is concerned. The Department mostly has to rely on external helpers for equipment for sound production effects, whereas if the department had gadgets, it would be of great help for productions and the students in general.

A respondent indicated that:

> *In 2017, during a production of* The Murder of the Surgical Bone *directed by David Salah, the director conducted post-performance audience interviews to gather feedback. Some audience members reported that they were unable to hear the actors clearly during the performance, highlighting challenges related to sound projection and audibility (Respondent D).*

Sound is one of the elements of theatre; it works synergistically in synch with other elements like the set, light, properties, and makeup. It plays a role that enhances the production, sound output amplifies the voices of the performers, ensuring that the audience hears every detail of the play or event, and even apart from that, it captivates the audience into a certain realm. The issue of poor sound output in the department, with reference to the Amu theatre, came up. It was also mentioned that actors find it difficult to reach a large audience during productions due to poor acoustics in the auditorium.

According to a respondent:

> *Sometimes, because of the hollowness of the stage, it is very difficult to reach the last row of the audience in the auditorium. And also trying to project, trying to raise your voice at the same time, and maintaining the level of your voice so that you do not scream in the ears of the audience is very challenging. So sometimes when you stand on the stage, you feel like there should be some kind of system that should carry your voice to*

> *the last audience member. But here is the case, there is nothing like a mic on stage or an acoustic in the room to help your natural voice. So, I end up straining my voice each time I am trying to project to the hearing of others in the auditorium (respondent B).*

Some of the actors mentioned how sometimes they find it tough to act or perform on the stage to a larger crowd due to the nature of the hall and the seats mounted in it.

The interior picture of the Amu theatre

Figure 2: *The interior picture of the Amu theatre from the audience's point of view*

Source: From Researcher's Field Notes

During my focus group discussion, some respondents said:

> *Talking about projection in the auditorium, the seats are not rigged, so, in terms of projection, we find it difficult. You are playing a role like an old man. As an old man, we know that the voice is weak, and to help it, he will need more energy to talk by reinforcing the voice. Sometimes when we are trying to project, we might go off track, or we will be out of character, coming to our normal voice in attempting to project. So, it is a very challenging thing when it comes to voice projection in our auditoriums (respondent B).*

The respondents further disclosed that sometimes, you can vary your voice, in the case you want to whisper because you need to project for the last person to hear, you end up

shouting instead of whispering and projection the same and the effect of whispering is defeated. So, it is a challenge for the actors. This happens because there is articulation, so they might think they are articulating, but rather they will be shouting. Sometimes, while on stage, they think they are reaching the last audience, but are not, meanwhile they have gotten to the peak of their voice. And sometimes it results in the actor getting lost with his or her lines and losing his or her voice in the course of the production, which should not be so. The respondents continued by saying they think it is basically about the acoustics of wherever they are performing.

A respondent stated that:

> *Depending on the kind of director, most of the directors we work with on campus when it comes to voice projection. They do not take it easy on the actors. I feel like they do not consider the fact that there are no acoustics, the actors are working with their voice, they are trying to project, and at the same time, you stand by and come into shouts, project, project, project, the more you are shouting project, project, the more they become tied and exhausted because the person is trying his or her very best to protect (respondent B).*

Sound in any theatre department should be the prime agenda; the relevance of sound can never be understated. Because no production or event goes on without sound. If actions are taking place and dialogue is ongoing, what is being said, what is being communicated through action, should be done with the aid of quality sound to make the production or event as audible as possible for every single person seated in auditoriums. So, there is no production in the theatre in the department that goes on without sound, including other events. Have the whole production worked out, but without quality and audible sound, no one can hear what has been directed. Without sound, no one can hear or feel. If the actors are speaking without sound being made and

being heard clearly, no audience can make meaning of the words that are being said on stage or acted out on stage. In response to the statement, another interviewee asserted that:

> *It might be very challenging to reach the last audience in the auditorium at times due to the hollowness of the stage. Additionally, it can be difficult to project your voice or raise it while yet keeping a reasonable volume so as not to shout in the audience's ears. Sometimes, when these things occur when you are on stage, you feel that some sort of microphone should take your voice to the final audience, but in this instance, there is nothing comparable on stage. Or the room's acoustics could be improved to support the natural voice. So, whenever I try to project, I always end up streaming my voice (respondent B).*

Other respondents in a group discussion mentioned that sometimes, because of the bad acoustics of the auditorium, it is very difficult to reach the last audience member in the auditorium. He mentioned that the development office, which is in charge of facilities, should try to consult the experts in acoustics to assist or help advise the development office when putting up auditoriums for theatrical performances. And also talking about the projection with the auditorium we have, the department should be well-equipped in terms of devices and gadgets to help the students produce good and quality sound during theatrical productions.

Figure 3: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

Figure 4: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

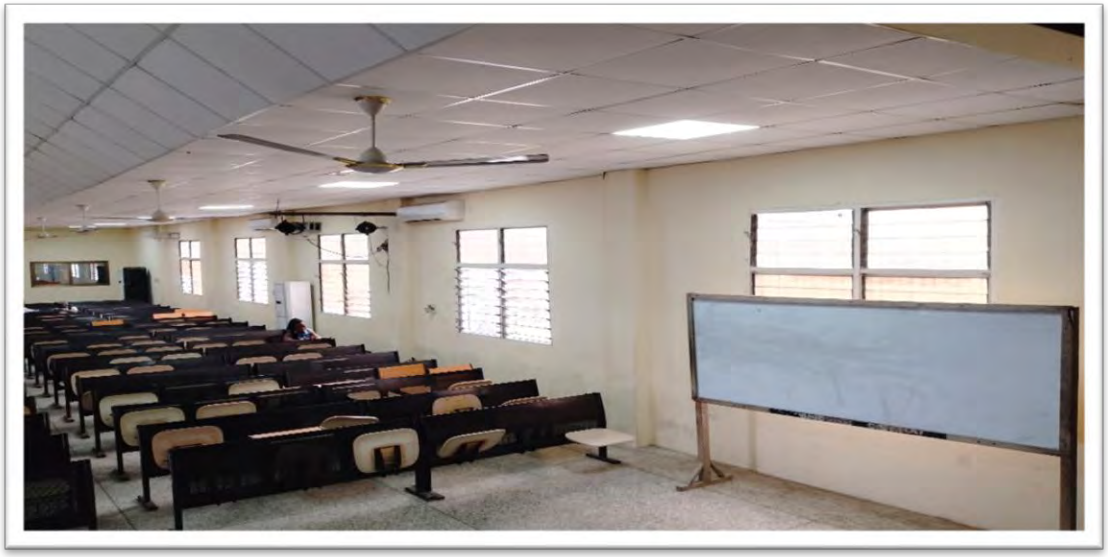

Figure 4: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

A respondent mentioned:

> *I think it is basically about the acoustics of wherever you are performing. In the theatre, during production, the last person needs to hear loud and clear, and, in an attempt to project, most often, an actor ends up shouting instead of projecting. There is articulation when speaking, and to articulate very well, one does not need to shout if only the acoustics in the room or the theatre are better or were done well to trap the sound from going out and sound outside from coming in (respondent B).*

In effect, the sound is vital to any theatrical production. Sound in theatre performs diverse roles, from supporting vocal amplification to shaping atmosphere and enriching the entertainment experience of a production.

Significantly, sound is a part of a whole when it comes to theatre production, without which most audiences will miss out on the dialogue, emotional understanding, and misunderstandings. Amplification of sound enables the control of the quality of sound produced for a production. Amplified sound facilitates clarity and enhances the sensory

engagement of both the actor and the audience.

RQ 2. What are the basic processes involved in theatrical sound production?

Sound in theatre involves much more than simply selecting appropriate sound effects for a production. It plays a vital role in engaging the audience by conveying information, enhancing the overall production value, stimulating emotional responses, highlighting onstage action, and establishing mood. When effectively used, elements such as dialogue, sound effects, music, and even moments of silence can significantly enhance the impact of a performance.

In theatrical sound design, sounds are generally classified into two main categories: live or practical sounds, and recorded or pre-produced sounds. Live or practical sounds are created in real time either on stage or just off stage during the performance. Examples include door slams, footsteps heard offstage, explosions, gunshots, thunder, or music performed by actors or musicians on stage.To produce a sound in theatre, the sound designer must engage in a complex and multi-layered procedure that will allow each sound effect or sound element added to the process to have a purpose and add to the greater good of the emotional connection to the audience (Drake, 2012).

Since sound is a wave, it has all of the properties attributed to any wave, and these attributes are the four elements that define any sound. They are frequency, amplitude, waveform, and duration, or in musical terms, pitch, dynamic, timbre (tone colour), and duration.

The basic process of sound production starts with Commitment. A respondent revealed that:

First and foremost, in theatre, you are not supposed to be forced into

> *the rules; you should have a passion. And apart from that, one should have an orientation. He mentioned that one should have an orientation with the use of sound facilities and should be a smart person. Sound is not just about pushing knobs. It is about reading the script, understanding and interpreting the script, giving it meaning and importance because those who listen to the play need to hear, and understand before they interpret. So, if you do not go through this exercise, reading the script to understand from the director's point of view what the director needs and what the audience needs to hear, you fail or go off (Respondent C).*

This means with sound, what needs to be done is to ensure that you work with the script as mentioned earlier. When a task or project is given out, you should, first of all, look for a reference point. What am I supposed to do? Oh, it is the slaves by Mohammed bin Abdullah? If it is the slaves, I need to read the script.

The first reading is to enjoy the story, familiarise yourself with the characters, know the interactions of the characters, and know the relationships between the characters for the first time. The script needs to be read again, critically, with a second eye to deduce technical areas that have to be solved, maybe the beheading of somebody, and there is a sound that has to be produced by the person being beheaded. So how can I get a sound for these main scenes? If I cannot get a sound on the net? What do I do? There should be further research into these areas that need special attention. Now, if you cannot get the desired sound for a particular scene, then you have to look for somebody who can create a sound. That is why theatre is more robust; it is a collaborative art. The sound design can be described as the Process of "specification, acquisition, manipulation or

generation of an audio element" used in various disciplines such as television and theatre production, radio, filmmaking, and live performance (Adoyi, 2017). The mere fact that you are a sound person does not mean you know it all. So, you are just like a stage designer; you can be a stage designer, but you cannot know how to do certain special effects or even makeup. All these areas are interconnected.

Respondent B indicated:

> *Before you do a theatrical sound production, you need a term of reference; the first thing you would consider is the script. It is not about the equipment but the script. Now, the demand of the scripts will direct you as to how to go about the sound (Respondent B).*

When you are reading, you are looking at the materials that you need, you are looking at the budget, you are looking at who can assist you, you are looking at human resources and extra hands, you are looking at the equipment, and the quality of equipment you are going to use. Responses gathered also revealed that when you get a niche of the production, another thing about it is how, and this is the budget. One has to put a budget together, everything that you are going to use, and you have to look at those who are helping as extra hands, those who will be at vantage points. For instance, if you are going to use lavalier microphones, or you are going to use a headset, there should be helping hands who will assist in dressing the actors and changing the receivers, the microphones, and the headsets they are wearing backstage.

The sound designer needs to sacrifice in reading and analysing the play, to know the script, the perspective of sound effects to use, and the director's intention. According to Fahlenbrach (2008), the embodied model that directs our perceptual, cognitive, and emotional experience is called sound design. Respondent indicated

> *Reading the script is not only about deducing the dialogues, but it is out of the scripts, you can get the needs of the production, apart from your personal experience. So, if you read a script, it tells you the sort of dialogue that is delivered. Therefore, what do we need? This will help you to come up with the accessories you need for the production or event. What is the area or space you are covering? Or do we need microphones? Or do you need a lapel microphone or a Lavalier microphone? So, it is out of the treatment of the script that gives you the needs of the production (respondent C).*

The second most important process is the research into the details of the historical background of the play and anything that has to do with the play. The sound design in theatre creates a sonic envelope that masks ambient noise within the performance space and enhances the theatrical narrative, thereby intensifying its emotional and visceral impact on the audience (Whittington, 2009). The process goes on to deal with the selection and gathering of various sound effects to be used. It could be existing sounds, recordings of new sound effects, or downloading from the internet.

According to the respondent:

> *Folly sometimes sounds as if we want to create something like an earthquake, we do use wood to slop each other, or if you want to create something that drops, just put heavy woods together. So, it was more mechanical, just more mechanical. If they wanted to create a bird chirping, they had a certain device they poured water into, and it sounded when air was blown into it, but then we did not have these kinds of digitised formats. If they want to slap somebody, they have a way of doing it. So, it was more manual and mechanical, but now with the development of technology, modernity, awareness, and also creation, innovation was coming into the limelight, and technological advancement came to kick in. Now we move from analogue systems to digital systems (Respondent C).*

With the introduction of laptops and then the internet, there is no limitation. Gone are the days when theatre started, and people started using certain gadgets to create sounds, for instance, putting stones, bottles or metals in a can, you sort of damage it in a way by bringing the ends together. So, it clicks together and creates sound when it is shaken. We can do this to generate sounds. But it becomes very easy with the digital formats. So now most things have been condensed into the Digital States. So, most of the students use their laptops, go online, look for the effects, and come and play on their laptops. And it helps, but not everything has been condensed into chips, Pendrive format. So, you do not have so many things in the observatory or the sound booth; it is just your laptop. They get on to the net, and they fish out for sound effects, but it has to be in conjunction with the director's concept and context with the production. Anderson (2012) also postulates that sound design can encapsulate all components of theatrical sound, including music, dialogue, sound effects, and voice-overs, and "it can involve conceptualisation and practical efforts as well as cooperation with the director, producer, composer, editors, and other creative personnel on a film" (p.31).

Every knowledge is containerized and with the internet, there are certain things students do with it. When you get onto the internet, whatever you are looking for, you can have it, and it is self-taught. So, you do not find students being taught some of these things.

The final one is the implementation of the gathered sound effects and evaluation, particularly during rehearsal hours. Sound effects are used for the following reasons in production to stimulate reality, create mood, and generate illusion. A sound designer could only obtain the related sound of the play, dance, or musical opera in question by studying its concept, which requires a thorough reading of the script involved. At least three times overall reading could well bolster the creativity of the designer, and this is

where he or she takes notes of all spaces where sounds fill in the script. Furthermore, a search for these sounds by all necessary and available means, be it the internet, folly artistry, recordings, and so on. House Music and contextual music are also very key parts of this sound build-up too.

Again, testing of these sounds must be done at rehearsals where the designers play these sounds through to see their fitness in the theatrical production. Soyer (2017) postulates that sound design turns into a diegetic sound with a good and clearer sound output that creates a feeling. The moment the audience realises the moment of the beauty of the entire universe, space travel, and the moving image itself, sound design brings a very real moment of dignity. After all these rehearsals, the major technical dress rehearsal night is a passport that gives the green light for the sound production to move with the main theatre production or event.

An informant stated that:

> *Sound is an integral part of the theatre. But we should not be limited to sound alone; the area of light should be considered as well. What we need to do as an institution is to ensure that we do a lot of orientation in the area of sound and light, as the major technical areas, for the students to understand what sound and light are, and what goes into sound. And also, there is a need for the department to invest in good sound equipment and sound production to enrich the teaching and learning of technical theatre (respondent C).*

Further interactions with the respondent established that a thorough search into the needs of what the department wants to help students with and ensure that those needs are provided, otherwise, day in and day out, they will be spelling the needs, but they cannot meet the needs. So, what they need to do is to ensure that the department pushes

for equipment to be bought and also more training to be brought to that area of technical theatre.

In an interview, a respondent mentioned that students are introduced to the various sound equipment used for the productions in an abstract and this does not help learning. Sound design purposefully communicates to an audience through recorded and created sounds that augment the onscreen visuals; sound design does not merely replicate what is happening on the screen, it is an additional storytelling component (Candusso, 2012). Fortunately, most students are familiar with some of the sound equipment, even playing musical instruments. Some students are in theatre, not in music, but play a musical instrument. And looking at the 21st century, everything is on the net, you can teach yourself how to create sound, and how to use software, everything you see gone were the days that you needed to go to school and learn this. But when you get onto your internet connection, you can read some of these things (respondent C detailed).

But ideally, in a theatre school, you need to go through such a course as sound design, basic sound engineering, and sound production, just as one will do set design and lighting design, basically to help. So, for one to efficiently handle a project in sound production, you should have gotten a good orientation in it. It is so interesting because I see people handling sound, students sign up for sound, sign up for lights, and the product works, but no one sits down to think of how the students get it. Sound for theatre performances is a hearing experience created to support the story of a narrative, documentary, commercial film, or television program. It may tell the story directly, or it may be used indirectly to enhance the story. Even if there are isolated perceptual devices for sound and motion pictures, the sound may be integrated by the audience along with the picture into a complete whole, without differentiation (Holman, 2010).

Often, you find a student who did acting behind the console, mixing sounds, and so ideally, we need to get facilities where students can sign up for a sound tutorial. That is why it was indicated early on that the School of Creative Arts has music, visual arts, and other aspects of arts and dance, so it is more like a one-stop shop in the industry. So, if some departments need to beef up, or if they need a compliment, they can follow up on the expertise of the music department.

In actualising technical sound for any theatrical production, the key things are reading and understanding what is expected from the play in collaboration with the directors, who are directing the production, technical, directing, and then the overall director. You should have a concept of what you are working on. Maybe you need some effects, maybe that plays directs you to use a certain set of sounds. Maybe you need a background sound, maybe you do not. And then after understanding this concept, you move on to creating your cues. After creating cues, you move on to rehearsal with the team. We are with a cast and crew to understand what you are supposed to do, what action is needed, the effect of what dialogue becomes a cue, and what can change as a result of the production, which would also change how sound is rendered as production moves on from the sound people who are part of the production. Then you will need logistics to implement to help make the sound as beautiful as the production unfolds and goes on to complement the sets that have been designed, the costumes that have been designed, and the beautiful acting that was gone. And all in all, most of it depends on having a cue that is ready to go. If the cue is ready, it means that we can have a production. Now, when we do not have a cue, we might not even know who would be speaking at what time and who would be entering the stage at what time, so sound cues for sound people in the process of productions in the theatre are very important. In any theatrical production, understanding of the concept through a production conference,

generating or initiating sound cues through reading and understanding of the play, and suggesting some sound, whether adding extra sound effects or not. And then also moving on to implementing what you have rehashed throughout to have results. As an element of design, sound plays a vital role in the world of fiction and non-fiction films, as it helps add meaning to on-stage action and is also used by theatre practitioners to tell a story directly or indirectly, enhancing the overall effect of that given production (Adoyi, 2017).

RQ3. How can sound production be improved during staged productions in the Department of Theatre Arts?

Actually, like composition, acting, directing, and lighting, sound assumes a basic part in the accomplishment of any extraordinary dramatic creation. Sound works inseparably with different components of the execution to help charm the crowd and bring them into another domain. Firmly identified with lighting as far as innovation is concerned, sound deals with a wide range of instruments that are utilised to deliver and intensify both natural and artificial sounds in the theatre. Theatre has been depicted as a universe of sound and visual segments (Enendu & Okome, 1994). The aural segments in this way get cardinal and critical information, which cannot be disregarded, but instead should be considered, controlled, and applied to acknowledge powerful correspondence between the entertainers and the crowd. Without anyone else, sound capacities are a key specialised perspective in any acclaimed execution, just like light. Sound plays a crucial role in providing exposition in theatre. Realistic sound effects—such as gunshots, doorbells, or ringing telephones—prepare the audience for forthcoming events on stage, enabling them to anticipate developments and transition mentally into the unfolding scenes smoothly and naturally.

Sound can be improved to ensure a powerful atmosphere and create a realistic mood, based on what the stage gives to the audience by reinforcing the qualities and even quantities of loudspeakers in the auditorium. Insightful or special training or tutorials should be given to student sound designers to bring top-class productions from there. Even though there is a recording studio at the Department of Music, sometimes and even more often, sound designers of Theatrical productions find it quite difficult to get access to record-quality sounds because of schedule congestion at those recording places, and so a recording studio for sound production should be considered to bolster the performances of sound designers in the Department. Sounds should be given thorough attention by all and sundry to see to it that the best is always used for the betterment of the theatrical sound productions.

The data obtained revealed the history of sound in the department. The department itself has some sound equipment; there is a mixer console, some speaker types, mics, and lapel mics that are not working. These are the few sound equipment items currently available for use in the department, but they are not the recommended types of machines for theatrical sound production. This means the department itself does not have recommended sound facilities. But the department works hand in hand with the music department for services, and the department also provides for them because, as much as they have sound, which is a peculiar facility, the theatre department also has lights. So, they have this kind of mutual agreement where if the department wants to use sound to boost performances, they can ask, and they provide, but as a department considering the technological advancements in this era, the department should have its sound equipment and facilities to be able to meet specific needs.

During the focus group discussions, an informant asserted:

> *Talking about the state of arts facilities, theatre is looking at sound facilities that give crystal clear sounds in the area of theatrical production, where the audience would hear everything as indicated as crystal clear sounds, there should not be hitches, there should not be conflicting sound, the sound output should be very good, whether you are near or at the rear of the auditorium or theatre, one should be in the position of hearing the dialogue. It does not matter where you are, it should be rich, whether you are seated near or far, and everyone should enjoy the same (respondent C).*

To resonate with good sounds depends on the facility itself. Considering the effect of architecture on sound, if the structure within which the performance is supposed to be cooked does not have the standard theatre structure level, forget about good sound; you cannot have very good sound outputs. According to Llewellyn (2002), theatrical design evolved from the open-air amphitheatres of the Greeks and Romans to the wonderful variety of types we see today. But for as much as the theatre facility in terms of the building does not lend its architectural form to this standard theatre structure, then a good sound cannot be produced in the facility as a building, because the Amu theatre, for one, was not designed as a Play House for productions. So, from that point of view, good sound production is ruled out in the facility, effective theatre production cannot be held there, and whatever is done there, the sound will give problems and bring the production or event down. It will not work out for sound quality because of the nature of the architectural designs used for the facility. Now, in this growth period, the School of Creative Arts' theatre was recently built, and it has had the opportunity to be tested for resonance, tested for acoustics, and tested for the level of wave strength in the building. The technical aspect of audio production has been neglected since architecture is a concern.

Figure 5: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

Figure 6: *The interior of the School of Creative Arts theatre*

Source: From Researcher's Field Notes

Sound production equipment is not an integral part of that architecture. But if it was built with sound in mind, they would have made provision for sound and amplitude as far as the waves and the output levels are concerned. According to Burkart (2008),

acoustics refers to “the nature of the space in which the drama takes place”. In trying to decide whether or not sound specificity should be more beneficial acoustically, I would consider the environment or channel in which the sound is presented. More of a difficult surface is more likely to generate reverberation, larger empty areas often generate echo, and smooth or flowing areas can muffle or engulf sound (Burkart 2008, p. 16). The acoustics of the theatre and the material used, and the process involved, are not the best for the facility, so there is sound leakage. Whatever you hear should be commensurate with the building and the volume of the building, but here is the case where the music department had a production before, and the building was not well-suited for sound production. Eggenschwiler (2005) suggests that theatre halls should be built according to the general terms of current acoustic data so that they can be finished with reasonable and convincing reasonableness. One could hear sound leaking from the outside and vice versa from the facility. With the School of Creative Arts Theatre, the sound was not factored for performance apart from the soundproof material that was used for the guilty.

Pictures of Some Soundproof Materials

Figure 7: *Floor Underlayment*

Source: Retrieved from Internet (2022) https://www.snoringsource.com/types-of-

soundproofing-materials/

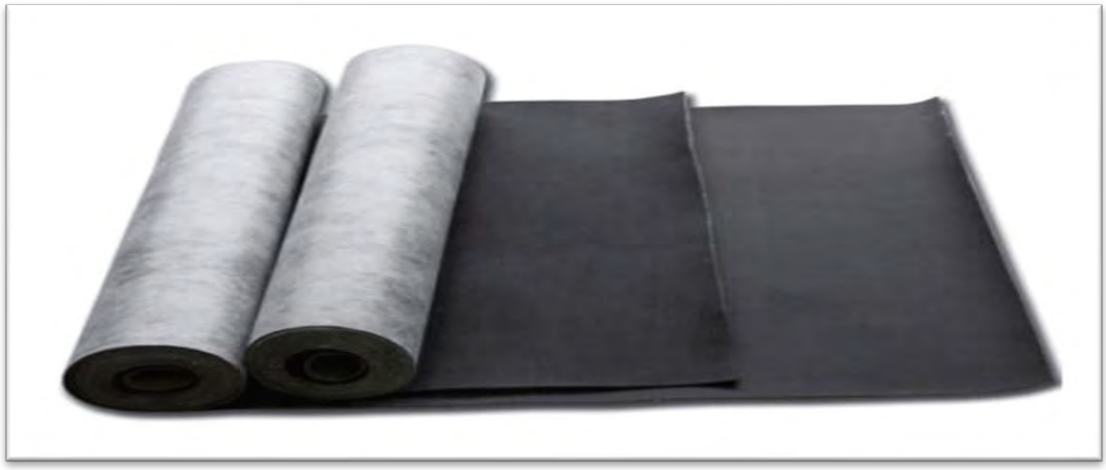

Figure 8: *Mass-loaded-vinyl*

Source: Retrieved from Internet (2022) https://www.snoringsource.com/types-of-soundproofing-materials/

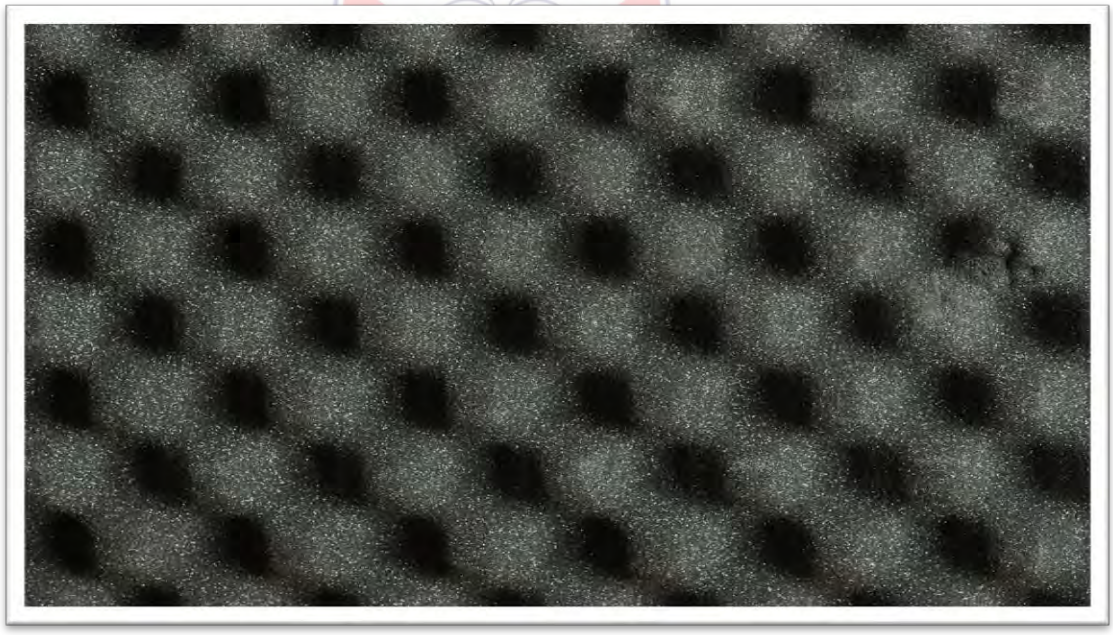

Figure 9: *Sound-absorbing foam*

Source: Retrieved from the Internet (2022). Retrieved from https://www.snoringsource.com/types-of-soundproofing-materials/

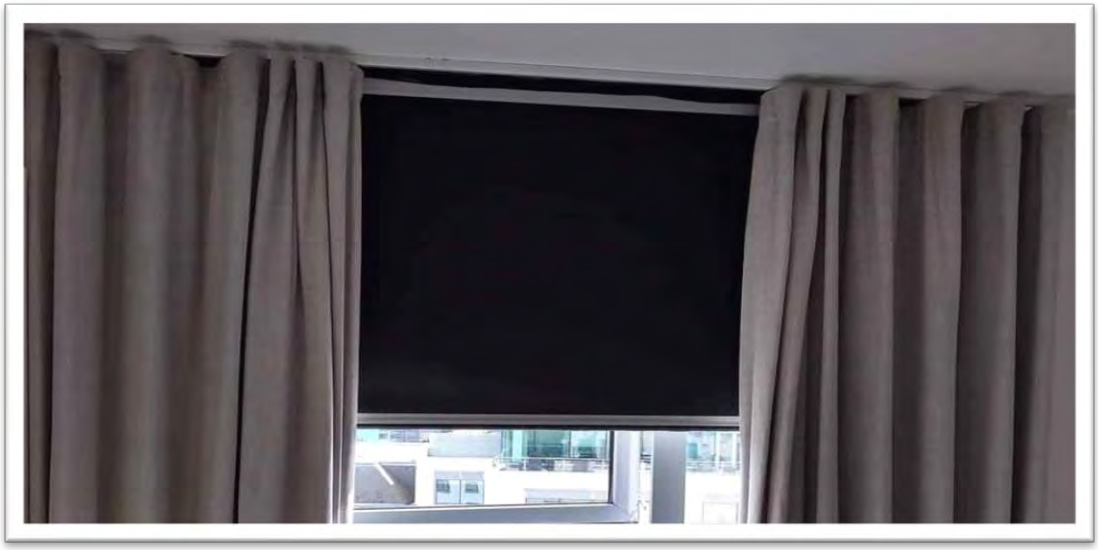

Figure 10: Soundproof curtains

Source: Internet (2022). Retrieved from https://www.snoringsource.com/types-of-soundproofing-materials/

Figure 11: *Soundproofing insulation*

Source: Internet (2022). Retrieved from https://www.snoringsource.com/types-of-soundproofing-materials/

There are numerous options available for soundproofing, and the variety of materials, each serving different purposes, can make selecting the right one challenging. The

choice of soundproof material depends on factors such as the type of noise to be blocked, the available space, and the installation method required.

An informant averred:

> *With our theatres, the only thing we can do is to make them soundproof and look at the resonance and look at the acoustics. Apart from that, we can improve on them by making sure that the soundproofing is done well, and taking care of the glasses and the louvre blades, because if the louvres are there, the sound will leak in and out. So, it is about the structures. If we can look at the structures and redesign them to make sure the configuration gives us a soundproof environment, then we can practice theatre there. Otherwise, if it is like this, with the glasses, walls not padded, and floors not carpeted with sound-absorbing materials, it will not work (respondent A).*

The various glass openings in the School of Creative Arts theatre

Figure 12: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

Figure 13: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

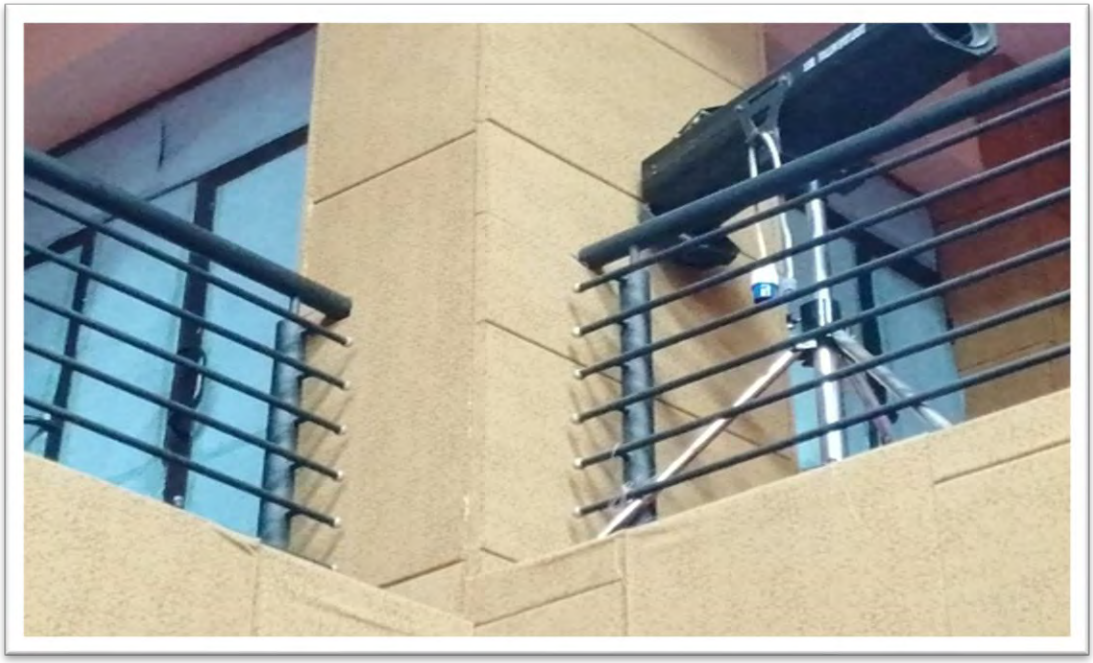

Figure 14: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

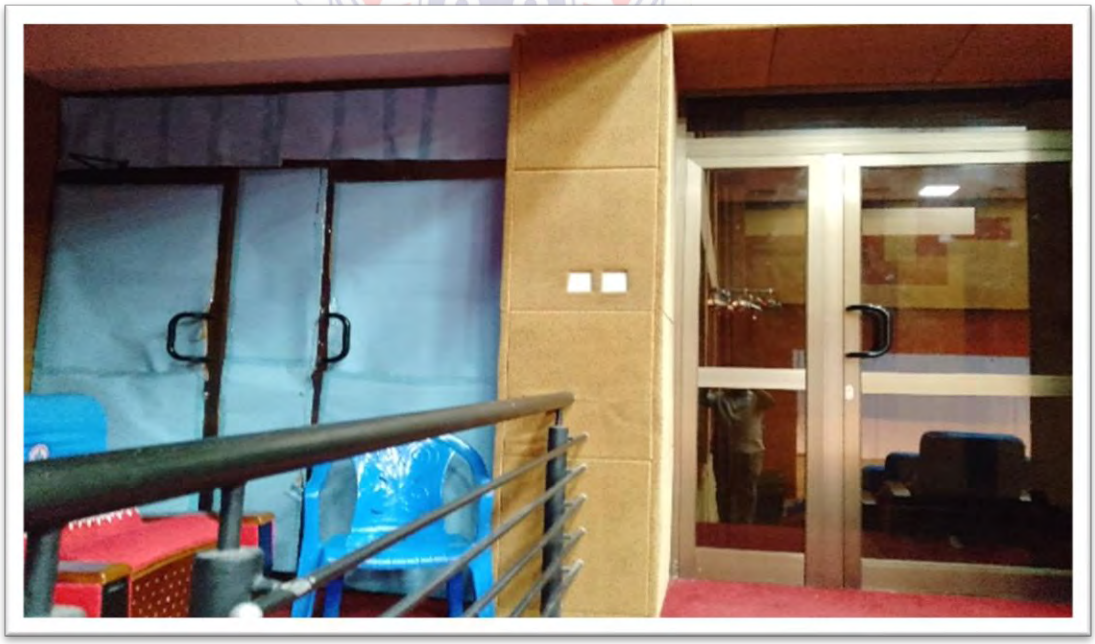

Figure 15: *A cross-section of the Amu theatre without acoustics*

Source: From Researcher's Field Notes

Figure 16: Glass opening

Source: From Researcher's Field Notes

Ginn (1978) states that if a building element is to have an excessive sound discount index over a wide range of frequencies, the appearance (wall, floor, door, window) must have high mass and low stiffness. From the above pictures and interviews, the performing facilities need to be ensured of adding mass and density to the area, that is, the use of acoustic panels and floor underlay here in terms of soundproofed elements or good and heavy curtains for damping, which could take off excess sounds. Researchers have attempted to correlate the subjective dimension of acoustic pleasure in concert halls, relying entirely on listeners' views on actual performances, with physical properties that can be measured and possibly predicted (Inácio, 2005). With the School of Creative Arts theatre, the soundproofing is quite okay, even though there are some challenges because of the glass and the opening of certain areas. Neither space has sound requirements because it was not considered. And for the facility to have good

sound delivery, there is a need to measure the level of sound that the facility can handle. It is not about putting heavy speakers there, but it is about putting the ideal machinery to drive the whole production. Respondent C indicated:

> *Depending on the structural configuration of the facilities, if heavy sound output is placed there, it could cause the structure. The structure would break down because then the excess sound wants to go out, with these heavy outputs, and before it is realised, there will be cracks in some parts of the walls. There is an example of the national theatre where they bring big sound equipment with huge volume outputs than before, but it was realised that the ceilings began to crack because it has not been built with the requisite materials to withstand that shock. So it is not about the size of the equipment, it is rather the quality of the equipment and sound produced. So, to improve the sound quality here, we need experts to come and take the amplitude, to come in and measure the room size and come out with the level of sound that is supposed to be in the building. It is not just about providing the facility, it is sometimes realized that when performances are ongoing when someone is outside of the theatre, the person will hear sounds from the inside of the theatre because of the outlets, especially when the person is on the first and the ground floor, sounds could be heard coming from the inside of the theatre and vice versa (respondent C).*

Carlos (2005) posits that while building acoustics primarily focuses on how room boundaries interact with sound propagation, it is the first wavefront that reaches the listener (the direct sound) and represents the most important properties of what is perceived by Schalls (Carlos 2005, p. 10). Theatre is theatre. Theatre is not a music auditorium. But there are facilities built as music auditoriums. And when it is music auditoriums, they have looked at the size of it, they have looked at the building vis-à-vis the equipment that is installed. There is well-investigated knowledge that has gone into that to serve the desired purpose. But it is realised that in Africa, when people put

up facilities, they do not consider the science part of it. It is all about the arts parts, which is nice. It is not about the niceness, but about how effective things can be. In sound isolation, according to Gjestland (2019), the sound reduction index (Dw) is used to describe how well a cinema auditorium is acoustically isolated from its surroundings. According to the data collected, it was revealed that when the School of Creative Arts' theatre was being constructed, due diligence concerning the science of theatre was not considered. In the theatre, sound levels were not calculated or were not formulated, or it was not built with that kind of scientific knowledge. It was just built. We need a theatre; we need a structure. That is, looking at the two facilities here, the effect of architecture on sound is in play. The interviewee specified:

> *Yes, they did not bring a sound specialist to look at it. These people came in the person of Azonko, but Azonko is a sound engineer. He is not a sound specialist. We have sound specialists. We have ear and throat specialists and so on. Specialists for the human part. But we also have a theatre sound engineer. He is not supposed to come and do the architectural sound work here. He is supposed to see how sound emanates, how sound is produced. That is what he is supposed to do. But not to look at the architecture of this place. No, he has got his business. We have sound specialists for theatre (respondent A).*

You realise that in most of the banks in Ghana, where you are inside a bank, Sound from outside is very difficult to hear. If you have realised it. Meyer Sounds (2010) states that the constellation energetic acoustic system marks an important breakthrough in acoustical science, one that solves a challenge confronted by utilising many modern overall performance venues. When you are inside the banking halls, and cars are passing, the sound you might not hear. So, what are the banks using that theatres building institutions would not look at? For one, I have been observing this whenever I

am inside a banking hall; it is very difficult for me to hear sounds from outside and vice versa. The effect of architecture on sound is mentioned in Chapter Two.

Now, looking at the state of the performing arts theatre in this modern world, theoretical facilities do not need a huge sound facility in terms of big speakers and their accessories to drive an auditorium, but create outputs where acoustic engineering, microphone installations, voice projection, and training will be the most vital destinations. The university is a professional intrapreneurial institution where these theatres are found; they are supposed to be modal theatre, especially the School of Creative Arts theatre. Of course, facilities in the theatres are needed to teach students, but it all boils down to money if the university can invest in that area to improve the performance of students. According to the respondent:

> *Standing mics are a no-go area. And for a theatre facility, there again, we need Phantom mics. You need unidirectional mics that can pick up sounds, and they should be hung. Yes, so it can pick sounds from any area for you, rather than just the floor. We have floor mics that can also pick up sounds, but they too have to be well used, because then they can pick up footsteps (respondent D).*

Microphones are designed for particular purposes and specific purposes, and in the theatre, when an actor is given a hand-held microphone, the actor is disarmed, because the body is the tool of the theatre artist as a dancer or talking about dramatic performances. It means if you give a microphone to an actor, you have limited his or her actions, but, there again, certain productions need to use microphones. If, for instance, production has to do with musicals, you will have to handle a microphone, but it is important to use body microphones when it is a theatrical production. Body microphones, like lapel microphones, at best will be phantom microphones, overhead

microphones, or lavalier microphones. Microphones are a principal section in the production of a live performance on the stage as much as they are in live sound reinforcement (Flinn, 1998).

Pictures of Some Microphone Types for Performance

Figure 17: Wireless overhead microphones

Source: Internet (2022). Retrieved from

https://www.dpamicrophones.com/microphones-for-theatre-applications

Figure 18: Gooseneck condenser microphone

Source: Internet (2022). Retrieved from

https://www.dpamicrophones.com/microphones-for-theatre-applications

Figure 19: Mini wireless cordless clip-on

Source: Internet (2022). Retrieved from

https://www.dpamicrophones.com/microphones-for-theatre-applications

Figure 20: Gradient condenser microphone

Source: Internet (2022). Retrieved from

https://www.dpamicrophones.com/microphones-for-theatre-applications

Figure 21: Floor microphone

Source: Internet (2022). Retrieved from

https://www.dpamicrophones.com/microphones-for-theatre-applications

Figure 22: Professional Lavalier microphone

Source: Internet (2022). Retrieved from

https://www.dpamicrophones.com/microphones-for-theatre-applications

Body microphone usage techniques

Figure 23: Mini condenser microphone

Source: Internet (2022). Retrieved from

https://www.soundandcommunications.com/using-microphones-in-theatrical-environments/

Figure 24: Mini condenser microphone

Source: Internet (2022). Retrieved from

https://www.soundandcommunications.com/using-microphones-in-theatrical-environments/

Figure 25: Wireless microphone

Source: Internet (2022). Retrieved from https://www.soundandcommunications.com/using-microphones-in-theatrical-environments/

Figure 26: wireless condenser microphone

Source: Internet (2022). Retrieved from https://www.soundandcommunications.com/using-microphones-in-theatrical-environments/

In theatrical productions, wireless microphones are used to amplify the voices of actors or singers. Lavalier or headset microphones allow for close-miking, ensuring clear and high-quality audio. However, theatres operating on limited budgets often try to minimize the number of microphones used. Common approaches include suspending a few overhead microphones or placing a few perimeter (floor-mounted) microphones at the front of the stage (Sigismondi, 2008). While overhead or boundary microphones are more affordable and can serve as an alternative, the overall sound quality must remain stable and consistent throughout the performance. Selecting the right brand and model is crucial to achieving optimal audio, and the equipment should be durable enough to withstand the rigors of live theatre. Properly functioning microphones, managed by a skilled sound engineer, ensure that the performance maintains its intended tone, preventing technical issues from turning a drama or tragedy into unintended comedy.

A respondent detailed:

> *I think it is good that you get good acoustics and good voice training. So, microphones that are hanging upside down at good angles will help actors in projection and reach the audience in the theatres. It is another challenge when we talk of projection without good acoustics and voice training. So, I think voice training will help actors get to the auditorium. We should try as much as possible to train each student as an actor. So that whenever a student finds himself or herself on stage, he or she would be able to cope with the situation there. Yeah, if you train me to be able to carry only my voice when I get to any stage outside the school that has an acoustic, I will find it difficult if you have never used a performing facility with acoustics. So yes, you have to look at both sides, for instance, theatre for development, go for those shows. Still, students who are used to projecting when they give them a mic, reject because that has not been the training. Yeah. So, we have to look at both sides, every mic on the stage, and also train students in terms of rejection and balance their voice with a mic (respondent B).*

Good acoustic and voice training will also be good for performances, but it is also believed that if there are good acoustics in the performance hall and the space is big with more audience, microphones are set at good angles and body microphones on actors, good sound production can be assured. Eargle (2012) explains that the basic rule of the microphone approach for any application is to get the microphone as close as possible to the desired sound source.

A respondent indicated:

> *First and foremost, we need to strengthen our technical department. We need equipment, we need learning facilities. And also, we need to ensure that collaborative teaching is the way forward because right now, the music department has two studios; we don't even have one to do a demo, we have to go to them and beg. But there should be an understanding that the studio is for the school of creative arts. So anytime you need to use this, you sign up, you sign in, then you go used and of course, we need to have technical men, who will man these various areas or laboratories, and that should be their duty. Do we have a sound engineer? Do we have a lighting person? Well, we need these people to manage these areas so that if we want to do practical teaching and learning, they will take the student through (respondent C).*

Information gathered from the data obtained revealed that the course should be such that when students come to level 100, these technical areas should be assessed. Now, when the student has the basics and builds on the basics, basically like how to focus light, how to plug in a light, how to patch the dimmer pack with the control board, or how to change the sequences of the LED, these are basic things. And also, the colour scheme, what colours to use on stage, should happen in the area of sound. Sound is not just about house music, but it is about the creativity and the mission of the sound. If, for instance,

I want a clap, I can decide to use two sticks and clips to create. It is honestly the playback, of course. Now, these are ingenious things one has to come up with because theatre is about creativity, it is about going to the factory and creating something.

A respondent detailed:

> *Everything is very possible, very possible. You know, so I would say we should have the facilities to teach the kids, the students and also as part of our course structure, we should be there because this area is the basis on which most of the activities thrive without it, there is a skeleton, the performance becomes bad if you do not have technical stuff. You do not need amplification if you have a small performance space because the architecture lends its subsequent subscriptions. We bring in huge sounds when you have lots of people because you know the human being absorbs sound when there are so many people, and it is via special effects. That is where you bring in these more than state-of-the-art facilities to drive the show. So, there is a need to introduce these things (respondent C).*

From the data collected, sound production can be improved during production if the department can provide quality sound systems and gadgets for producing and recording sound effects. There should be a periodic orientation for students on how these systems are handled and how they are operated.

A respondent made this assertion:

> *Serving and being a student for four years in the theatre arts department of the University of Education was a beautiful experience. I majored in acting as a minor and TFD, and I have had the training of going through technical theatre as a sound person for most of the productions that were conducted in the school or other departments during my period. It was quite interesting and challenging because, at a certain point, we did not have microphones, and we did not have sound equipment that was*

> *readily available for the theatre department to use for their productions. And you would have to as they were borrowed from the music department for us to have the production as an academic training institution for stage actors, we could understand the fact that you are being trained to project to use your voice without any amplification, but then also, where you have the auditorium the theatre, Amu to the praetorium as your only location or the main location for us to have our productions, it was at a point needed that will should have these logistics to help us to produce amazing productions related to acting on stage and amazing production related to the sound quality of what is being produced also on stage. How did we go around it? often would either go to suppliers ourselves to rent this equipment, especially lapel microphones to use for these productions. I remember some productions would have to wait or run the first show without microphones and then use the microphones for the second production. All in all, my sound during the four years of my stay in school gradually improved. The first year was much better, the second year improved, where we had Clement assume as technical soundhead, whom we all understood at a certain point after training from the National Theatre of Ghana in Accra, where we got inputs on how to profile the stage (Respondent D).*

Further interrogations revealed that in improving the sound production in the department of theatre arts during theatrical performances, there should be logistics available for the sound production itself, the logistics do push the best standards out there, then it means that the sounds being produced will be the best if you have the best of engineers behind the equipment, but if the equipment is not standardized of quality, means that there might not be able to have the sound that is needed for any production. I suggest that the sound and communications systems in the theatre should include sub-systems for amplification in the auditorium and production communications. So, logistics are very important. And then the fourth hour will be to improve the sound in the department, which means training students to start from a level by introducing them

to the nitty gritty of sound effects, graphics, equalizing, gaining, compressing of sound, and all of those things needed to be understood by the technical students who do production, because in the industry, production people are the ones that are brought out to come in and handle sound production and it causes the problem, what you hear in a studio is quite different from what you hear when you are having a live production and live production is different. Sound has a lot of dynamics to do in productions, so if training is considered as vital as anything, then it means that the training of theatrical sound students has a particular innovation of concept for sound, by actually being able to understand the dynamics of sound to be able to complement theatrical productions. This means these students will be top-notch, creative, or sound transient students who, when it comes to living drama Production which is needed in the industry, will be able to deal with it. And in the modern sense, you would have to deal with live band issues or extend our sound issues as well. So, if one can get this training, much of the problem of developments that are not individual developmental concepts would recede through the improvement of sound in the theatre or the theatre department.

In an interaction with the researcher, the respondent asserted:

> *In an industry where I have worked for some time. It is how people use microphones and how people use sound aids that are given to them on the stage because it should be that as you are trained to be able to project your voice when a sound aid is failing you, you should be able to speak loud enough so that this sound aid can then project more what you are seeing many actors who have encountered in the industry feel that when you have a sound a like a microphone, means that the microphone does all the work and they forget that they are the ones that produce the sound. If they will not produce sound, the sound guys cannot give them dialogue to produce, so they need to produce their own sound, and tender microphones will pick up the sound that they are producing. If it is high, then the sound guys will bring it down. If it is low, they*

would also know how to push it up to gain some pitch and some volume on it (Respondent D).

Additionally, when dealing with sound in a theatrical production, the production team huddles so that everyone is on a level par to understand what is needed of the sound produced to fixate with learning. With the actions of actors and everything, they forget that they also need to work with a sound team, so that if the team knows that an actor has a low voice, then they can be helped so that the actor can be audible. If an actor has a challenge with the voice, he or she mentions it, and it will be treated in a way that allows a lot of people to hear what the actor speaks on stage and hear the words he or she speaks.

With good consultations, the department could get some basic equipment that could help in sound production through the aid of microphones, speakers, and all sound equipment that will be available at a point to help with the sound production, and many will attest to the fact that audibility, clarity in speech and everything will be as expected. The departmental productions will be able to use them quite well to achieve the aim of having an artistic production without the problem of straining to hear dialogue from actors. And then also sound accomplishment could accompany, especially the productions.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter summarises the research, draws conclusions, and makes recommendations on all the important issues that came up concerning sound production during theatrical performances in the Department of Theatre Arts at the University of Education, Winneba. Similarly, the chapter provides a discussion of the limitations of the research study and gives recommendations for future studies.

Summary

The study examined the state of theatrical sound production during stage performances in the Department of Theatre Arts within the various performance facilities. It also looked at the reason why sound has not been given the needed attention when it comes to the issue of theatrical performances. The following research questions of the study provided results regarding sound in the theatre, sound reinforcement, the effect of architecture on sound, and types of sound facilities for theatre. Research question one identified the relevance of sound amplification to sound production in the department during theatrical performances. Research question two aimed to come up with the basic processes involved in theatrical sound production. Research question three examined and looked into how sound production can be improved during stage production.

The study further extensively reviewed literature that served as the foundations upon which the findings of this research were critically analysed under the following concepts: sound in the theatre, live sound reinforcement, theatre acoustics, the effect of architecture on sound, theatre sound production, sound design and designers, and types of sound facilities for theatre.

Semiotics theory was also used to elucidate the data and enabled the researcher to make sense out of the data analysed.

The research approach and design for this study were qualitative (Creswell, 2014) and qualitative content analysis (Given & Olson, 2003). This provided the researcher with the chance to discover how sound is perceived in the department. Respondents were selected using the purposive sampling technique (Creswell, 2013). The data collection method used was through interviews, focus group discussions, and participant observation, which helped the researcher to gain an understanding to answer the research questions. Using semi-structured interviews with open-ended questions, I engaged participants to find out their viewpoints on the phenomena under study. I finally analysed the data using thematic analysis (Ayres, 2008), which helped me to intensely organise and describe my data thoroughly.

Main Findings and Conclusion

Subsequent to the data analysis in this research, the vital findings that were discovered led to numerous conclusions. First and foremost, research question one (QR1), which sought to identify the relevance of sound reinforcement to theatrical sound production in the department of theatre arts, revealed that sound amplification is important in theatre. The analysed data exposed why Sound has been an integral constituent of the experience of theatre, and it's been the peripheral and subordinate to the text, body, and spectacle in theatre. Also, the analysed data looked into why sound amplification is vital in sound production. The data revealed that sound reinforcement bridges the gap between the actors and the audience and assists the audience in hearing and comprehending the message being sent across by the actors. Findings from the research revealed that during theatrical productions, the atmosphere is created when sound is put

together in its right proportions and perspectives. Music or sound bites are used to set up the tone by establishing the right atmosphere between the scenes. Additionally, the data revealed that if the sound is good to the ear and sound bites are produced well, it helps in arousing the feelings of the viewers. Good sound with acting helps make the audience a subject of the plot and is also used to manipulate the emotions of the viewer. The data analysed further exposed the effect of architecture on sound and how performance facilities should be designed to aid in the setting up of sound equipment, which will help with audibility. The data revealed that the space between the stage and the first audience seat is very close. Ideally, that space was supposed to be the orchestra pit, but it was not designed to be so; loudspeaker boxes are placed there for performances, and it disturbs audiences in the front row of the theatre. Because of the positions of the speaker boxes there, sound operators are compelled to bring volumes and levels down in the theatre, which also cuts off audiences at the rear of the theatre from hearing well.

The data analysed also exposed the bad state of the Amu theatre as a performance facility. It was revealed that the theatre is not well constructed for theatrical performances, which makes it difficult for actors to project to the last person in the theatre. It was mentioned that the opens that is, the doors and windows in the theatre as a building is too many, making it difficult for sound to be trapped, and the hollowness of the stage and the hall makes actors scream a lot, causing loss of voice most of the time when they are on stage performing. Also, it was discussed that the nature of the seats and their arrangement is a contributing factor to poor sound in the Amu theatre.

Research question two (RQ2), which sought to look at the basic processes involved in theatrical sound production, came up with a few outlines and processes. The basic process in sound production starts with commitment. The data revealed that before

attempting any theatrical sound activity or design, you need a reference point, and it was mentioned that the reference point here is the script. Sound is not just about pushing knobs. It is about reading the script, understanding and interpreting the script, giving irrelevant importance because those who listen to the play need to hear and understand before they interpret. The data revealed that reading the script will help you familiarise yourself with the characters to know the relationship between them and the playwright's intentions. The sound designer needs to sacrifice in reading and analysing the play, to know the script, the perspective of sound effects to use, and the director's intention. Further reading of the script critically the second time will assist you in deducing the technical areas that need to be talked about. This process is the research into the details of the historical background of the play and anything that has to do with the play. As revealed by the data, the process goes on to deal with the selection and gathering of various sound effects to be used. With the data gathered, it was revealed that the implementation of the gathered sound effects and evaluation should be the next process to be considered. After all this, the sound personnel will now design their sound cues for the various scenes and the entire production. It was revealed by the data that the sound designers and technicians for productions should have an orientation with the use of sound facilities, and should be smart people.

The findings of the third research question (QR3) likewise sought to find out how the production of sound can be improved during productions in the Department of Theatre Arts.

From the data analysed, sound can be improved to ensure a powerful atmosphere and create a realistic mood, based on what the stage gives to the audience by reinforcing the qualities and even quantities of loudspeakers in the auditorium. The findings of this data revealed that the department itself has some sound equipment, there is a mixer

console, some speaker types, mics, and lapel mics that are not working. These are the few sound equipment items currently available for use in the department, but they are not the recommended types of machines for theatrical sound production. It was noticed that resonating with good sounds depends on the facility itself. Considering the effect of architecture on sound, if the structure within which the performance is supposed to be cooked does not have the standard theatre structure level, forget about good sound; you cannot have very good sound outputs. It was mentioned that the Amu Theatre, for one, was not designed as a Play House for productions but just as a students' assembly hall. So, from that point of view, good sound production is ruled out in the facility, and effective theatre production cannot be held there. But the School of Creative Arts' theatre was recently built, and it has had the opportunity to be tested for resonance, tested acoustically, and tested for the level of wave strength in the building; it did not materialise. The technical aspect of audio production has been neglected since architecture is a concern. Provision was not made for sound, and the amplitude, as far as sound waves and output levels are concerned. The acoustics of the theatre, the material used and the process involved are not the best for the facility, so there is sound leakage. It was revealed that the glass openings on the building were not well designed to prevent sound leakage as well. That is, looking at the two facilities here, the effect of architecture on sound is at play. Now, looking at the state of the arts theatre in this modern world, theoretical facilities do not need a huge sound facility in terms of big speakers and their accessories to drive an auditorium, but create outputs where acoustic engineering, microphone installations, voice projection, and training will be the most vital destinations. The university is a professional intrapreneurial institution where these theatres are found; they are supposed to be model theatres, especially the School of Creative Arts theatre, because facilities in the theatres are needed to teach students

to improve their performances.

Also, findings of the study indicated microphones are designed for particular purposes and specific purposes, and in the theatre, when an artist in the theatre is given a hand-held microphone, the actor is disarmed, because the body is the tool of the theatre artist as a dancer or talking of dramatic performances. High-quality sound is essential for a successful theatre production. Even if the play is award-winning and the actors deliver exceptional performances, poor audio can prevent the audience from fully engaging with the performance. The effectiveness of a production relies heavily on the clarity and fidelity of the sound, capturing the emotions behind every word, sigh, or whisper. Additionally, incorporating background and ambient sounds enhances the intensity of the performance and enriches the overall audience experience. In this context, the choice of microphone, its correct placement, and proper handling and protection are all critical factors. The data analysis in this study specifically examined techniques for using body-worn microphones. The findings of this research finally revealed that sound has a lot of dynamics to do with productions, so if training is considered as vital as anything, then it means that the training of theatrical sound students has a particular innovation of concept for sound, by actually being able to understand the dynamics of sound to be able to complement theatrical productions. Insightful or special training or tutorials should be given to student sound designers to bring top-class productions from there.

Suggestions for Further Studies

In light of the challenges and opportunities I encountered when reviewing literature and collecting data for this study, the following suggestions are outlined for future

researchers.

Follow-up research can be carried out for additional studies, taking into consideration the teaching of theatrical sound production in detail as a cause under technical theatre. Also, the practical-based experience of sound production in theatre with a focus on routing, sound configuration, sound processing, and main mixing.

Recommendations

Based on the discussions and conclusions of the study, the following recommendations are made:

Sounds should be given thorough attention by all and sundry to see to it that the best is always used for the betterment of theatrical sound productions.

Amplification of sound in its right proportion and levels enables the control of the quality of sound produced for production, and amplified sound facilitates clarity and enhances the sensory engagements of both actor and audience. So, it is recommended that performance facilities should be well-designed and built to aid in sound installation and sound configuration.

Sound reinforcement can be upgraded during productions if the department can be provided with quality and requisite sound systems and gadgets to aid theatrical performances.

The basic process of sound production starts with commitment. It is recommended that one should have an interest in the area of sound to enable them to deliver to the best of their ability. The script should be read several times to make one understand the script writer's intent and analyse the script to come up with what is needed as sound machinery mechanisms for the production, taking into consideration the

director's concept for the production to be able to deliver the best in terms of theatrical sound production.

Mass and density should be added to the performance theatres to improve acoustics, to give the facilities good soundproofing and with this, leakage of sound will be solved or minimised.

With good consultations, the department should get some basic equipment like microphones, speakers, and needed sound equipment to mention a few, that will be available at a point to assist with the sound production, and many will attest to the fact that audibility, clarity in speech and consistency will be as expected.

Lastly, there should be a periodic orientation for students on how these systems are handled and how they are operated.

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APPENDIX

QUESTION GUIDE FOR ONE-ON-ONE INTERVIEWS AND FOCUS GROUP DISCUSSIONS

RQ ONE: How relevant is sound reinforcement to sound production in the Department?

1. What role do you play in theatrical productions in the department?
2. What is the purpose of sound in theatrical settings?
3. Why is sound amplification important in ensuring good sound production?

RQ TWO: What are the basic processes involved in theatrical sound production?

1. a) What sound production machinery are currently available in the Department of theatre arts?

b) What type of equipment are used to strengthen sound during production?

2. What are the fundamental methods involved in theatrical sound productions?
3. What is the procedure used in theatre sound production setups?
4. Who regulates proper pre and post-production sound set-up and tear-down?

RQ THREE: How can sound production be improved during staged productions in the Department of Theatre Arts?

1. What can be done to advance the efficacy in sound production during performance?
2. What appropriate steps are needed to be taken to expand sound clarity in the auditoriums?
3. What advanced style can be incorporated into the production of sound in dramatic/theatrical production in the department?