UNIVERSITY OF EDUCATION, WINNEBA

COMPARATIVE ASSESSMENT OF THE QUALITY OF EARLY CHILDHOOD PHYSICAL ENVIRONMENT IN PUBLIC AND PRIVATE SETTINGS IN HO MUNICIPALITY

CHARITY ANYIDOHO

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CHARITY ANYIDOHO
(8231900001)

**A thesis in the Department of Early Childhood Education,
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DECLARATION

Student's Declaration

I, Charity Anyidoho, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or in whole, for another degree elsewhere.

Signature: ……..…….

Date: ……..…….

Supervisor's Declaration

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

Name of Supervisor: Prof. Michael Subbey, PhD.

Signature: ……..…….

Date: ……..…….

DEDICATION

To the Almighty God

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ABSTRACT

This study assessed the quality of the physical environments in public and private Early Childhood Education (ECE) centres in Ho Municipality, focusing on indoor spaces, spatial quality, and facilities. Despite Ghana's increased enrolment in ECE, many centres lack conducive environments for effective learning. The approach used was quantitative approach and sampling techniques were simple random and census sampling technique. A correlational survey design was adopted, involving 200 kindergarten teachers—100 each from public and private centres. Data were collected using a Likert-scale questionnaire and analysed using descriptive statistics (means, standard deviation, and percentages) and t-tests. Findings revealed that public ECE centres had better-organized indoor spaces, promoting active participation and safety, with superior spatial quality in noise control, teaching and learning materials, ventilation, and lighting. While excelling in seating flexibility, private centres showed mixed perceptions of classroom arrangements. Both centres demonstrated similar hygiene levels with adequate hand-washing facilities but lacked sufficiently child-friendly washroom facilities. Teachers from both settings highlighted the need for visually stimulating environments, flexible seating, and hands-on learning materials. The study concludes that public centres generally offer more supportive learning environments than private ones. However, both types need improvements in child-friendly amenities and strategies to enhance physical learning environments. The findings highlight the need to resolve educational disparities to ensure high quality learning experiences for young children.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In Early Childhood Education (ECE), educating learners is frequently seen as a shared responsibility between parents and teachers. However, the Reggio Emilia approach views children's learning environments as the third teacher, playing an important role in children's education alongside parents and educators. This approach highlights the fact that the learning environment serves as the third teacher to the child. Learning environments provided during the early years are crucial for fostering optimal learning outcomes and setting a solid foundation for future educational success (Dockett & Perry, 2020). Among the essential aspects of early childhood educational settings, the quality of the physical aspects has gained significant attention in recent research. The physical learning environment uniquely connects physical spaces to early childhood education (Slutsky & Pistorova, 2010).

Philosophers in the field of early childhood education (ECE) such as Reggio Emelia, Vygotsky, and Maria Montessori believe that a child's early experiences in a high-quality learning environment serve as a foundation for lifelong success and are crucial for the development of the brain (Montessori, 1967; Rentzou, 2014). Montessori's insights, dating back to 1967, highlight how changes in the arrangement of furniture, the implementation of structured activity schedules, and adjustments in instructional methods during daily routines can positively influence children's conduct while reducing the likelihood of challenging behaviours.

Building upon this foundational perspective, Sobel (2018) defined the physical learning environment as the careful design and intentional organisation of spaces to facilitate

meaningful learning experiences for young learners. Ultimately, Sobel's perspective emphasises the need for a purposefully crafted physical learning environment that actively promotes active engagement, exploration, and learning among young children. It acknowledges that a well-designed environment can profoundly impact children's educational experiences and developmental outcomes.

Studies show that positive experiences in ECE centres can compensate for the disadvantages experienced by individuals due to the nature of the environments they were born in (Harms et al. 1998). A welcoming, spacious, neat, warm, and bright learning environment encourages and creates room for cooperative play, physical movement, symbolic, and dramatic play which helps the holistic development of their whole being (Rentzou, 2014). On the contrary, Gyekye-Ampofo and Osei-Poku, (2023) found that limited access to age-appropriate materials or overcrowded spaces restricts children's opportunities for active engagement and inhibits their learning potential. In essence, the seamless connection between these insights reinforces the critical importance of the physical learning environment in early childhood education as a dynamic catalyst for holistic child development.

As research in the field continued to evolve, studies began to explore the impact of the physical environment on children's learning outcomes and well-being. Studies conducted by Obaki (2017) and Organisations like the OECD (2020) have scrutinized the varying physical environments within early childhood settings and explored their potential implications for children. Notably, a study by Bidwell et al. (2014) highlighted significant disparities in fundamental infrastructure between different preschools in these peri-urban African settings. This study by Bidwell et al. (2014) revealed that preschools in Soweto, South Africa, and Ashiman, Accra-Ghana, were equipped with

key facilities like toilets, playgrounds, secure school compounds, and electricity. In contrast, many preschools in Mukuru, Nairobi, Kenya, were found to lack significant portion of these infrastructural features.

In Ghana, like in other countries in sub-Saharan Africa, early childhood education services are offered by both government-run institutions and private Organisations, including NGOs, religious groups, communities, and profit-driven entrepreneurs. These diverse stakeholders have varying motivations for their involvement in early childhood education, as discussed in studies by Orkin et al. (2012) and Sitati et al. (2016). While some of these early childhood education centres offer suitable environments with adequate play areas, appropriate facilities, and clean sanitary conditions, a significant number do not provide the necessary settings to facilitate effective teaching and learning, as highlighted by Amissah-Essel et al. (2020). Challenges are particularly prevalent in public early childhood education centres, where resource constraints often lead to overcrowded spaces that hinder active engagement, as pointed out by Gyekye-Ampofo and Osei-Poku (2023).

One of the policies that underscores the quality of the physical learning environments in ECE settings in Ghana is the "National Early Childhood Care and Development Policy" introduced in 2004 by the Ministry of Gender, Children, and Social Protection (MoGCSP) in collaboration with stakeholders. It focuses on enhancing the overall quality of ECE services, including the physical environment. It also emphasises the importance of safe, child-friendly, and stimulating environments that promote optimal growth and learning for young children.

Extensive research literature underscores the pivotal role of three explicit physical environmental design parameters in early childhood learning; Firstly, Berries & Miller

(2011) noted that the physical environment should be thoughtfully designed to encourage spaces provided for learning centres and seating arrangements that boost exploration, independence, and freedom of movement among young learners. Such spaces stimulate a child's sense of curiosity, self-discovery, and eagerness to engage in play-based activities (Sugiyama & Moore, 2007). Research conducted by Amissah-Essel et al. (2020) in Ghana highlighted the critical role of the learning environment in Early Childhood Education (ECE) in shaping a child's autonomy and self-confidence. The limited space in ECE centres (Gyekye-Ampofo & Osei-Poku, 2023) hinders children's ability to actively participate in the learning process and develop their autonomy and self-confidence.

Again, spatial quality elements, encompassing factors like colour, lighting, ample ventilation, noise levels, and the selection of materials (Oppong-Frimpong, 2021), are recognised as influential components of the physical learning environment (Maxwell 2007). Research indicates that these factors significantly impact a child's cognitive and emotional experiences within the learning environment (Berries & Miller, 2011). For instance, appropriate lighting can create an inviting atmosphere that enhances engagement, while the choice of materials can influence the tactile and sensory aspects of learning (Oppong-Frimpong, 2021).

Furthermore, the provision of facilities including washrooms and hand-washing stations is deemed essential in early childhood education (Amissah-Essel et al., 2020). Reports by Organisations like UNICEF emphasise the need for safe and child-friendly washroom facilities to support children's dignity and well-being (UNICEF, 2017). These facilities ensure that learners remain healthy and active learners throughout their educational journey. However, the realisation of these critical facilities can face

significant challenges, primarily due to resource limitations in some public and private centres. These limitations can have a direct and adverse impact on children's well-being, hindering their access to proper hygiene and thereby impeding their cognitive and educational development (MoE-EMIS, 2018).

Finally, improving the quality of physical environment in early childhood settings is essential for promoting children's learning and well-being. Well-lit, ventilated spaces with child-sized furniture and accessible learning materials support children's independence and active participation (Hall et al., 2014; Lash 2008). Sensory-rich materials and spacious layouts enhance exploration and engagement, contributing to holistic development (Papadakis et al., 2020; Edwards, 2002). Such environments not only ensure comfort and safety but also stimulate curiosity and effective learning.

The physical learning environments have been acknowledged as a third teacher in ECE settings. However, the aforementioned studies did not offer a thorough comparative assessment of the indoor spaces, spatial quality, and facilities in early childhood physical learning environments. It is against this background that this study was conducted.

1.2 Statement of the Problem

Although Early Childhood Education (ECE) is recognised as essential and enrolment in ECE centres across Ghana continues to rise, most children still lack access to high-quality early education (MoE-EMIS, 2018), and many of these centres continue to face shortages of essential teaching and learning resources (Oppong-Frimpong, 2021) as well as conducive learning environments, among others (Gyekye-Ampofo & Osei-Poku, 2023). According to Oppong-Frimpong (2019), in many developing countries, including Ghana, a major concern has been the availability of facilities and learning

materials for Early Childhood Education (ECE) (UNESCO, 2010; Fourie, 2013; Atmore, 2013), with the lack of such resources posing a significant barrier to the delivery of quality education (UNICEF, 2017).

Reports from UNESCO (2010) and the Ministry of Education (2017) indicate that classroom practices in Ghana frequently take place in old, dilapidated classrooms or even under trees, particularly in rural areas, where classrooms suffer from poor lighting and ventilation, with little time for play—conditions that significantly hinder children's learning, Oppong-Frimpong (2019). It is worth noting that in some districts of Ghana, particularly in the Northern Regions, there are concerning situations regarding overcrowded kindergarten (KG) classrooms. These classrooms have an average of 55 pupils per classroom, and in extreme cases, the number rises to an alarming average of 86 learners per KG classroom, which stands in stark contrast to established standards (Ministry of Education EMIS, 2018).

Additionally, through personal experiences during internship, attachments, and national service at different occasions in some ECE centres in Ho, the researcher observed that many public and private centres face challenges in providing quality learning environments due to financial constraints. These experiences were further validated through discussions with both public and private school coordinators, who confirmed that these issues are present on the ground. Without a developmentally appropriate physical learning environment, effective teaching and learning cannot take place. This further emphasises the importance of investigating the disparities in the physical learning environments of ECE centres in the Ho Municipality. It is evident from these reports that the physical learning environments of some ECE centres in the Ho

Municipal do not have the essential facilities needed to function as a third teacher in a child's learning process.

The foregoing studies, however, did not offer a thorough comparative evaluation of the indoor spaces, spatial quality, and facilities across public and private Early Childhood Education (ECE) centres in Ho Municipality using quantitative approach within the positivist paradigm. A theoretical gap is evident as earlier works overlooked child-centred frameworks like Montessori's Prepared Environment and Reggio-Emilia's Philosophy about the environment being the child's third teacher. Without a developmentally appropriate physical learning environment, effective teaching and learning cannot take place. This highlighted the need for the researcher to delve into the issues of quality physical learning environments in terms of spatial quality, facilities, and indoor spaces in both public and private ECE centres in the Ho Municipality. Ho Municipality is justified as the study site because it hosts a diverse mix of public and private ECE centres with both urban and peri-urban settings, making it a suitable case for generating findings that are contextually relevant and applicable. This is the research gap this study aimed to fill.

1.3 Purpose of the Study

The purpose of the study was to compare the physical learning environment in public and private Early Childhood Education (ECE) centres in Ho Municipality.

1.4 Research Objectives

The study sought to achieve the following specific objectives:

1. Ascertain the quality of indoor space of public and private Early Childhood Education (ECE) centres in Ho Municipality.
2. Assess the spatial quality of public and private ECE centres in Ho Municipality.

3. Evaluate the facilities of both public and private ECE centres in Ho Municipality.
4. Examine strategies that can be adopted to improve the quality of physical learning environments in public and private ECE centres in Ho Municipality.

1.5 Research questions

The research aimed to answer the following key questions:

i. What is the quality of indoor space in public and private Early Childhood Education (ECE) centres in Ho Municipality?
ii. What is the spatial quality of public and private ECE centres in the Ho Municipality?
iii. What extent do public and private ECE centres in Ho Municipality differ in terms of facilities?
iv. What strategies can be adopted to improve the quality of physical learning environments in public and private ECE centres in Ho Municipality?

1.6 Hypotheses

The study sought to test the following hypotheses:

i. H_0: There is no statistically significant difference in the indoor spaces between public and private ECE centres in Ho Municipality.

   H_1: There is a statistically significant difference in the indoor spaces between public and private ECE centres in Ho Municipality.

ii. H_0: There is no statistically significant difference in spatial quality in public and private ECE centres in Ho Municipality.

   H_1: There is a statistically significant difference in spatial quality between public and private ECE centres in Ho Municipality.

iii. H_0: There is no statistically significant difference in facilities between public and private ECE centres in Ho Municipality.

H_1: There is a statistically significant difference in facilities between public and private ECE centres in Ho Municipality.

1.7 Significance of the Study

The findings of this study would provide valuable benefits to:

Policy: Policymakers as the findings can help them make informed decisions about Early Childhood Education (ECE) centre regulations in terms of the physical learning environment.

Practice: Educators can create a better physical learning environment and parents can choose ECE centres based on environmental quality.

Theory: The study contributes to academic knowledge, enriching our understanding of ECE physical environments. Also, it can offer long-term benefits including producing well-educated, well-adjusted citizens, ultimately benefiting society.

1.8 Operational Definition of Terms

Within the context of this research, the following terms were used:

Quality – Quality in this context refers to the developmental appropriateness of the physical environment

Physical learning environment – Physical learning environment in the context of this study refers to the indoor spaces, spatial quality, and facilities.

Indoor space – Indoor space in this context refers to the spaces provided for learning and seating arrangements that boost exploration, independence, and freedom of movement.

Spatial quality – Spatial quality refers to the characteristics and features of physical spaces that contribute to the overall educational experience. Spatial quality in the context of this study includes lighting, room design (colour, Teaching and Learning Resources), acoustic (noise), and ventilation.

Facilities – Facilities in this study are the washrooms and hand-washing stations.

Public and private ECE teachers – refer to teachers who have received formal education in Early Childhood Education. This training encompasses in-service and pre-service education and the attainment of certificates, diplomas, degrees, or other recognised qualifications.

1.9 Delimitation of the Study

This research was exclusively conducted within the geographical confines of Ho Municipality. While the learning environments encompassed various components, the study exclusively focused on evaluating the physical aspect. Among the multitude of aspects encompassing the physical component, the research narrowed its scope to investigate indoor space, spatial quality, and facilities specifically. Lastly, the researcher worked with only trained ECE teachers who have undergone any form of training in early childhood education. They would have a fair knowledge of how the physical learning environment should be.

1.10 Limitations of the Study

Although both public and private ECE centres had equal sample sizes, the difference in sampling approach, random selection for public schools and census sampling for private schools which affected the uniformity of representation across the groups. Again, the exclusive use of quantitative data also limited deeper exploration of teachers' perceptions and contextual influences on the physical learning environment.

1.11 Organisation of the Study

The study was organised into five chapters to provide a comprehensive exploration of the research topic. In Chapter One, the focus was on establishing the foundation for the study, including the background, statement of the problem, purpose, research objectives, questions, hypothesis, significance, delimitations, limitations, and operational definitions of terms. Moving on to Chapter Two, the literature review delved into the topic of the quality physical learning environment. This exploration was structured under three key headings: Theoretical Framework, Conceptual Framework, and Empirical Review. This chapter aimed to contextualize the study within existing knowledge and research in the field. Chapter Three detailed the research methodology, covering aspects such as the research approach, design, population, sample, sampling technique, data collection instrument, and procedures. This chapter provided a clear roadmap for how the study was conducted, ensuring transparency and replicability. In Chapter Four, the gathered data was analysed and presented. This section provided a thorough examination of the data, contributing to the overall understanding of the study's findings. Chapter Five served as the concluding segment of the study. It encapsulated a summary of the findings, along with recommendations, conclusions drawn from the research, and suggestions for potential avenues of further study. This chapter aimed to synthesise the research journey, highlight key insights, and offer guidance for future exploration in the field.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

Literature review involves a thorough and evaluative examination of existing academic works related to a particular subject or research question. It involves reviewing, summarising, and synthesising relevant academic works such as books, articles, and other sources that contribute to the understanding of the chosen research area. The purpose of a literature review is to establish the background for the study, highlight gaps in current knowledge, and establish the theoretical framework for the study (American Psychological Association, 2020). This chapter, therefore, reviews and discusses literature relevant to the quality of early childhood physical learning environments in ECE centres.

Literature was reviewed under the following headings;

- Basic Principles of Environmental Design
- Theoretical Framework
    a. The Reggio Emelia Approach
    b. Montessori Method
- Conceptual Framework
- Developmentally Appropriate Environment (DAE)
- Quality Early Childhood Education (QECE)
- Ghana's Early Childhood Education Policy Framework
- Empirical/ Theoretical Review
    a. Indoor space (furniture arrangements and learning centres)
    b. Spatial qualities (lighting, room design (colour, Teaching and Learning Resources), acoustic, and ventilation).

c. Facilities (washrooms and hand-washing stations)
d. Strategies to be adopted to improve the quality of the physical learning environment

2.1 Basic Principles of Environmental Design

The early-grade educational environment must ensure the well-being of each child, recognising their entitlement to learning spaces that foster social, emotional, moral, physical, linguistic, and cognitive development. According to Malaguzzi (1998), learners have the right to environments devoid of excessive stress, noise, and both physical and psychological harm. Hence, it is imperative to incorporate these principles when designing educational settings for young children. These principles guide the planning and Organisation of environments to enhance the well-being and experiences of the occupants (McNally & Slutsky, 2017).

2.1.1 Principle of transparency

The principle of transparency emphasises the visibility and accessibility of various elements within the educational space, with a focus on promoting connections and relationships among children, teachers, and family members. This principle suggests that a well-designed learning environment should allow individuals to see each other easily and locate materials without difficulty. Moreover, it underlines the importance of maintaining a balance between transparency and privacy, acknowledging the need for secluded spaces for individuals to have moments of solitude and reflection.

In the context of the researcher's study on the quality of early childhood physical environments, this principle of transparency aligns with the Quality Physical Environment," specifically in the component of indoor space. The layout and Organisation of indoor spaces play a crucial role in facilitating transparency. According

to Fleer (2015), an open and transparent classroom design promotes positive interactions among children, encourages collaborative learning, and enhances the teacher's ability to supervise effectively. Research indicates that well-designed and transparent environments positively impact children's exploration, independence, and freedom of movement (Gronlund, 2010).

Also, research by Roskos et al. (2009) highlighted that the visibility of materials and the overall uncluttered nature of the environment positively influence children's engagement and exploration. Adequate lighting, proper ventilation, and thoughtful selection of materials contribute to creating a transparent and inviting learning space (Clements, 2015).

Applying the principle of transparency in early childhood education centres involves considering cultural, contextual, and resource-related factors. To align with this principle, classrooms can be designed with an open layout, fostering a sense of community and enabling effective supervision. Strategic arrangement of furniture and learning centres ensures a clear line of sight for both teachers and children. In terms of learning materials, educators should display them in a way that is visible and easily accessible. Regularly updating displays and showcasing children's work contribute to an engaging and transparent learning process. Additionally, creating designated areas or corners for quiet reflection respects the need for privacy while still maintaining an overall transparent environment.

2.1.2 Principle of flexibility

Flexibility is a fundamental principle in Environmental Design, highlighting the flexible and evolving character of learning environments to meet the varied needs and interests of those who use them. According to Bredekamp and Copple (1997), the

environment should be capable of evolving in response to the unique characteristics of individual learners and the specific dynamics of each group residing in it.

Flexibility, in this context, describes the ability of the learning environment to change and evolve based on the specific characteristics and preferences of the learners it serves. This adaptability is crucial in promoting a responsive and engaging educational atmosphere. A practical illustration of this principle can be observed when an ECE teacher anticipates the arrival of a group of learners with a specific interest, such as building. In response, the teacher takes proactive measures to design the classroom with two separate, combinable, or rotatable learning centres dedicated to building activities. It recognises that learners have different preferences, and the environment should be malleable enough to accommodate various activities and learning experiences. This adaptability not only enhances the educational experience but also contributes to the overall well-being of the learners by providing a space that aligns with their developmental needs.

In the context of the researcher's study on the quality of the physical environments in public and private ECE centres, flexibility becomes a critical factor. Assessing how well these environments can adapt to the evolving needs and interests of the learners contributes to understanding their overall quality. Recent studies emphasise the importance of flexibility in educational environments. According to Edwards et al. (2012), a flexible environment promotes active exploration and engagement, fostering a child's sense of agency and autonomy. This aligns with the idea that the environment should not only accommodate but also encourage learners to move materials, explore different learning centres, and have agency in shaping their learning experiences.

2.1.3 Principle of relationships

The principle of fostering relationships within the early childhood educational environment is a critical aspect of environmental design. This involves creating spaces that promote the building of lasting and meaningful connections between children, families, and staff. The physical environment should be conducive to building connections, with allocated and arranged spaces for gathering, snuggling, communicating, or simply being together. The aim is to establish an "at-home" feeling, steering clear of an institutional atmosphere commonly associated with childcare programs. This concept corresponds with Bronfenbrenner's Ecological Systems Theory, particularly the microsystem level. The microsystem encompasses the immediate environment in which a person lives, including interactions with family, peers, and educators. In the context of early childhood education, the microsystem involves the relationships and interactions within the classroom setting. The physical environment, as an integral part of the microsystem, plays a crucial role in shaping these relationships (Edwards et al., 2012).

The design of the educational environment becomes a significant factor in shaping these interactions, influencing the quality of relationships among children, families, and staff. In the researcher's study, the principle of relationships in environmental design reflects the microsystem by emphasising the significance of interpersonal connections within early childhood education centres (Edwards et al., 2012).

2.1.4 Principle of identity

The principle of Identity in environmental design, as articulated by Edwards et al. (1998), emphasises the importance of recognising and valuing each individual within an educational environment. This involves moving beyond traditional notions of

classroom displays and extending the representation of children, families, and staff to various spaces, with the understanding that no space should be considered marginal. Specifically, utilising spaces like bathroom walls or stall doors to showcase photos or artwork is highlighted as a meaningful way to communicate the importance of those spaces and contribute to building a sense of identity for individuals within the environment.

By incorporating visual representations in unconventional spaces, such as bathrooms, the principle recognises the significance of every nook and cranny in influencing a person's sense of self and belonging. This principle suggests that the physical environment, beyond traditional learning spaces, contributes to shaping the identity of individuals. For instance, works by scholars such as Chawla (2015) and Rivkin (2000) emphasise the role of environmental design in influencing psychological and developmental outcomes in children. These studies underscore the idea that unconventional spaces can significantly impact a child's sense of identity and well-being.

2.1.5 Principle of movement

The principle of movement in environmental design for early childhood education emphasises the importance of providing ample chances for learners to move around and engage in physical exploration within the space. Instead of constraining or suppressing natural movement, educators are encouraged to integrate bodily activities as an integral part of the learning process. For example, the American Academy of Paediatrics emphasises the role of physical activity in promoting healthy growth and development in young learners (AAP, 2018). Movement not only contributes to physical well-being but also has positive implications for cognitive development. As learners engage in

physical activities, they enhance their motor skills, spatial awareness, and coordination (Diamond, 2000).

In the context of this study on the quality of early childhood physical environments in public and private settings, the principle of movement is crucial. The design and organisation of indoor spaces play a pivotal role in either facilitating or hindering children's movement and exploration. Research by Pellegrini and Smith (1998) highlighted the importance of play and movement in the cognitive and social development of children.

2.1.6 Principle of representation

The principle of representation in environmental design for early childhood education emphasises the importance of providing learners with diverse and expressive means to convey their understanding of the world. According to Edwards, Gandini, and Forman (1998), this involves acknowledging the "hundred languages" of children, including but not limited to paintings, drawings, dramatic play, music, writing, and sculpting.

An in-depth exploration of this principle involves recognising the significance of offering multiple opportunities for learners to express themselves in various ways. This aligns with the idea that each child may have unique strengths and preferences in terms of communication and creative expression. Recent research in childhood education supports the importance of a multi-modal approach to learning and expression. For instance, a study by Siraj-Blatchford and Siraj-Blatchford (2014) highlights the value of providing diverse materials and open-ended spaces in early childhood environments. In relation to the current research on the quality of early childhood physical environments in public and private ECE centres, the principle of Representation underscores the importance of assessing whether these centres provide a rich and varied

set of materials and spaces that allow learners to express themselves through different mediums that support their holistic development.

2.1.7 Principle of independence

The principle of Independence in environmental design is rooted in the understanding that learners naturally seek and benefit from developing a sense of self-reliance. This idea is viewed as an essential and positive component of socio-emotional growth in early childhood. Creating a developmentally appropriate environment involves providing support for young learners to make decisions, engage in activities independently, solve problems on their own, and regulate their behaviour (Bredekamp & Copple, 1997). Current research by Smith and Jones (2020) emphasised that environments promoting independence positively influence children's cognitive and socio-emotional development.

In the context of research studies on the quality of early childhood physical environments in public and private settings, this principle holds significant relevance. The layout and design of indoor spaces should be structured to encourage and facilitate children's independence. For instance, the arrangement of learning centres, seating, and play areas should promote autonomy and decision-making among young learners. Therefore, incorporating the principle of Independence into the design of early childhood environments is not only a pedagogical consideration but also directly impacts the quality of the physical environment.

2.1.8 Principle of discovery

The principle of "Discovery" in environmental design for early childhood education emphasises the importance of creating an environment that encourages exploration and learning. This involves providing a balance between novel and familiar materials to

engage young learners. The idea is to fill learning areas with discoveries that captivate and sustain the interest of the children. Research supports the significance of discovery in early childhood environments. For instance, a study by Sallis et al. (2001) highlights the positive impact of environmental factors on physical activity in children. A stimulating environment that includes diverse and interesting elements can contribute to increased physical engagement and exploration.

The principle also emphasises that creating opportunities for discovery doesn't necessarily require a significant financial investment. As noted by Bruce and Kinder (2017), educators can achieve this by strategically arranging familiar materials in new ways or locations, thereby refreshing the learning environment without incurring substantial costs. Additionally, the use of treasures or items from nature is highlighted as another method to enhance the discovery aspect of the environment. In the context of the researcher's study, the discovery principle is crucial. By understanding and implementing this principle, educators can create environments that promote active engagement and learning among young children. Children. As a result, this could influence their experiences and well-being in both public and private early childhood education centres.

2.2 Theoretical Framework

The theoretical framework guiding this study draws upon the renowned educational philosophies of the Reggio Emilia Approach and Montessori's Philosophy. These frameworks were selected for their significant emphasis on the role of quality physical environment within educational settings.

2.2.1 Loris Malaguzzi (1920-1994) – Reggio Emilia Approach

The Reggio Emilia approach to early childhood education emerged in the aftermath of World War II in Italy, a time marked by devastation and limited educational opportunities for learners (Wien, 2008). Founded by the visionary educator Loris Malaguzzi, this approach aimed to provide learners with educational opportunities that were in stark contrast to the oppressive education they had experienced during the war. Its founding principles were rooted in the need to provide hope and freedom for learners in this challenging period. The Reggio Emilia programme began as a collaborative effort between educators and families to create schools within Italy's public education system, with an emphasis on the youngest learners (Edwards et al. 2012). This historical context underscores the approach's commitment to improving the quality of education for young children, making it particularly relevant to the researcher's study. By examining physical environments across public and private early childhood centres, the researcher aimed to assess the opportunities provided for children's development and well-being, aligning with the Reggio Emilia philosophy's emphasis on hope and freedom for young learners.

A core principle of the Reggio Emilia approach is the belief in the importance of the physical environment within educational settings. In Reggio Emelia schools, the physical environment is not merely a setting but is considered a language in itself, a primary aspect of thought development, and even referred to as the "third teacher" (Wien, 2008). This notion is crucial for the researcher's study, as it emphasises that the design, organisation, and quality of physical spaces are essential in influencing children's learning experiences. Therefore, the study on the quality of physical environments directly aligns with Reggio Emilia's perspective on the significance of these spaces in early childhood education.

The theoretical foundations of the Reggio Emilia approach draw from several prominent educational philosophies and theories. Social constructivism, a key element, finds its roots in the works of theorists like Lev Vygotsky, Jean Piaget, and Maria Montessori (Lim, 2004; Dodd-Nufrio, 2011; Firlik, 1996; Edwards, 2003). These theorists emphasise the role of social interactions, cultural context, and the child's active construction of knowledge, all of which resonate with the Reggio Emilia approach and an idea that directly relates to the researcher's study on the quality of physical environments and their impact on children's experiences. Furthermore, progressivism, as advocated by John Dewey (Edwards), encourages experiential learning, hands-on experiences, and child-centred education, which is consistent with the philosophy of the approach.

Once more, the Reggio Emilia approach is influenced by various theories in human psychology, such as Bronfenbrenner's ecological systems theory, Bruner's ideas on cultural psychology, and Gardner's theory of multiple intelligences (Hall et al., 2014). These theories provide insights into the interconnectedness of a child's development with their environment and the importance of recognising and nurturing diverse forms of intelligence. By examining how physical environments influence early childhood education, the researcher's study aligns with the Reggio Emilia approach's commitment to nurturing these diverse forms of intelligence and acknowledging the importance of the learning environment in that, learners possess multiple ways of knowing, understanding, and expressing themselves.

2.2.1.1 View of the child as a competent constructor

The heart of the Reggio Emilia approach is the profound belief that learners are competent constructors of knowledge and culture (Dodd-Nufrio, 2011). Unlike

traditional educational models that see learners as passive recipients of knowledge, Reggio Emilia educators view the child as an active respondent and knowledge maker in the learning process. Learners are seen as rich, competent, and creative individuals who have the right to express themselves in a multitude of languages, be it through words, movement, drawing, painting, building, sculpture, music, and more (Edwards, 2002). This perspective places a significant emphasis on the child's autonomy and capability to shape their learning experiences, an idea that deeply resonates with the researcher's study which focuses on the quality of physical environments in early childhood education.

The Reggio Emilia approach's commitment to a child-centred, creative, and stimulating physical environment aligns with the core elements of the independent variable, "Quality Physical Environment," which encompasses indoor space, spatial quality, and facilities. By integrating the Reggio Emilia perspective into the assessment, the study will aim to promote an environment that respects the child's rights and needs while fostering their competencies as constructors of knowledge and culture.

2.2.1.2 The learning environment as a "Third Teacher"

The Reggio Emilia approach introduces a unique perspective on the learning environment, considering it as a "third teacher." This perspective highlights the dynamic and interactive role that the physical environment such as spaces for exploration and freedom of movement plays in children's education, setting the stage for a rich and meaningful learning experience (Strong-Wilson & Ellis, 2007; Thornton & Brunton, 2007; Wurm, 2005; Wien, 2008). The concept of Reggio Emilia also suggests that the physical environment should provide important information and cues to children, such as what they can do, how and where they can do it, and how they can

work collaboratively (Hendrick, 1997; Fu et al., 2002; Rinaldi, 2006). Even though it may look unusual, the learning environment can act as a mentor for children, as seen in the works of Anne Taylor (Taylor, 1993; Taylor & Enggass, 2009), which sheds light on how the school environment can serve as a third teacher.

Also, in Callaghan's (2013) perspective, learners should be regarded as proficient communicators, partners, and creators of meaning, actively building relationships daily with both individuals and materials. Callaghan emphasises that learners possess capabilities for empathy, whimsy, sensitivity, and joy. According to her, classrooms should mirror these qualities by providing thoughtfully organised, visually stimulating and versatile materials that inspire learners to share their ideas in multiple forms.

Furthermore, the "third teacher" philosophy emphasises that the physical environment itself can instruct, guide, and inspire children. This means that the design, organisation, and contents of the learning space are carefully considered to maximise children's educational potential (Wien, 2008). The Reggio Emilia approach places significant importance on creating an aesthetically and intellectually stimulating environment that respects the rights and needs of learners (New, 1998). This involves careful consideration of the physical surroundings, including elements like colour, lighting, materials, and organisation. The aim is to provide an environment that not only meets children's basic needs but also challenges their intellect and encourages their innate curiosity. The researcher's study aligns with this aspect by evaluating the extent to which the physical environments in early childhood education centres within Ho Municipality are both aesthetically pleasing and intellectually stimulating. The Reggio Emilia philosophy underscores the importance of these environments being not only functional but also engaging and supportive of children's holistic development.

2.2.1.3 The concept of provocations

To spark learners' curiosity for learning, the Reggio Emilia approach embraces the concept of "provocations" (Strong-Wilson & Ellis, 2007). Provocations are intentionally designed materials, objects, or situations meant to excite students and ignite their curiosity. Provocations are intentionally designed to spark students' interest in learning by introducing materials, objects, or experiences that pique their curiosity. These provocations serve as a bridge between the child's existing knowledge and discoveries, igniting a sense of wonder and inquiry. In the researcher's study, this concept is essential, as it highlights the importance of physical environments that can provoke children's curiosity and stimulate their engagement with the learning process. The study will investigate whether these environments offer opportunities for learners to make their thinking visible, foster further learning, and promote engagement.

2.2.1.4 Co-creation of the learning space

A central aspect of thee Reggio Emilia approach is the joint creation of the learning space by both students and educators (Hewett, 2001). This collaborative relationship consists of reciprocal exchanges between the learners and adults about appropriate adjustments that can be made to ensure optimal growth and learning within the classroom setting. In the Reggio Emilia approach, Loris Malaguzzi likened the teacher-learner relationship to a game of ping pong, where each participate actively contributes to foster meaningful growth and learning (Edwards, Gandini, & Forman, 2011). This concept is highly relevant to the researcher's study, which assesses how physical environments are co-created and adapted to meet the evolving needs of children. It examines whether these spaces are flexible and responsive to the children's input and developmental stages.

Furthermore, the Reggio Emilia approach underscores the collaborative relationship between learners and adults in shaping the learning environment (Hewett, 2001). This relationship involves ongoing dialogue, reflection, and adjustments to create an environment that fosters optimal growth and learning.

2.2.1.5 Linking the theory to the study

The principles of the Reggio Emilia approach hold significant relevance to this study, which focuses on the comparative assessment of the quality of early childhood physical environments. The Reggio Emilia approach places a strong emphasis on the learning environment as a "third teacher." This concept highlights the dynamic role of the physical space in shaping children's educational experiences (Wien, 2008). In the context of the research topic, this perspective underscores the importance of assessing the quality of physical environments within ECE centres. It emphasises that these environments are not passive settings but active contributors to children's learning and development. The researcher's study aims to evaluate how the design and organisation of indoor spaces, spatial quality, and available facilities impact the overall quality of the learning environment. This aligns with Reggio Emilia's philosophy's view of the learning environment as a powerful influence on children's experiences.

The Reggio Emilia approach's alignment with the concept of a quality physical environment is evident in its commitment to creating aesthetically and intellectually stimulating spaces that respect the rights and needs of learners (New, 1998). This approach underscores the importance of the learning environment being both visually appealing and intellectually engaging, aligning with the researcher's assessment of spatial quality. The study aims to examine how factors such as colour, lighting conditions, ventilation, noise levels, and the selection of materials contribute to the

overall quality of the physical environment. By doing so, it resonates with the Reggio Emilia philosophy's emphasis on the importance of the learning environment being a place of creativity, curiosity, and engagement.

Furthermore, the Reggio Emilia approach's promotion of a child-centred, creative, and stimulating physical environment aligns with the study's investigation into the quality of physical environments in ECE centres. The approach views learners as competent constructors of knowledge and culture (Dodd-Nufrio, 2011), emphasising their active role in shaping their educational experiences. This aligns with the research's objective to assess how the design and organisation of indoor spaces, spatial quality, and available facilities empower learners as active respondents in their learning process. The study aims to determine how the physical environments within public and private ECE centres facilitate children's exploration, independence, and freedom of movement, aligning with the Reggio Emilia philosophy's focus on children's rights and creativity.

2.2.2 Maria Montessori (1990s) – Montessori Method

The Montessori educational model, developed by Maria Montessori in the early 1900s, aimed to provide a child-centred and developmentally appropriate learning environment (Edwards, 2003). The Montessori philosophy emphasises a child-centred approach where learners guide their learning at their own pace (Rambusch, 2010). The Montessori approach aligns with constructivist theories, emphasising learners as active constructors of their learning experiences. Similar to Dewey's constructivism, the Montessori model views learners as actively involved in constructing their knowledge (Rathunde, 2001). This perspective integrates Piaget's idea of spontaneous interest in learning (Edwards, 2003). Montessori's approach differs in its distinct periods and

stages (Crain, 2011), emphasising the importance of meeting the developmental needs of the whole child, inspired by Abraham Maslow's psychology (Weinberg, 2011).

Maria Montessori's idea of the learning environment acknowledges that learning is ongoing and should thus be reinforced by providing developmentally appropriate educational materials. It explores some of the ideas behind the learning environment and why the environment is so crucial to the future learning activities of a learner. It also acknowledges the role of the individual in building his or her own learning, Marshall (2017). Montessori developed core principles to guide the design of a child-centred learning environment, which includes independent movement and work, freedom of choice in work activities, and a comfortable learning environment.

One of the core aims of the Montessori philosophy is the complete development of the individual child, both cognitively and emotionally, through a child-centred classroom experience (Montessori, 1967; Edwards, 2002, 2003). This approach recognises the value of individual interests, pacing, and skills (Lillard, 1997; Deluca and Hughes, 2014). Montessori education is designed to assist in the psychological development of the child, supporting not only their rational aspects but also their spiritual side (Weinberg, 2011). This holistic aim aligns with the focus on spatial quality within early childhood education settings, which should provide a supportive environment for the growth of both mind and heart (Crain, 2011).

2.2.2.1 The role of the Montessori teacher

In the Montessori philosophy, educators play the role of guides, creating a supportive child-centred environment where learners can explore and learn independently (Edwards, 2003). They recognise the dignity of children, appreciate the importance of spontaneous activity, and support the child's emerging interests and perspectiveness

(Rathunde, 2001). The teacher's goal is to help learners develop confidence and inner discipline, intervening only when necessary (Edwards, 2002). This teacher-guided, child-directed approach is analogous to creating a learning environment with spatial quality. The physical space should support and inspire independent exploration, choice, and self-regulated learning (Lash, 2008). The concept of spatial quality is in harmony with this perspective, as it emphasises the design and Organisation of physical spaces to create an environment that is aesthetically pleasing, intellectually stimulating, and respectful of children's needs.

2.2.2.2 Montessori curriculum and focused learning

The Montessori curriculum centres around the use of carefully designed materials that promote hands-on learning, movement, and individualized study (Cossetino, 2009). Importantly, learners learn based on their interests, and the role of the educator is to guide the use of materials (Montessori, 1967). Learning involves hands-on, practical activities in areas such as mathematics, language, science, and more (Humphryes, 1998). Materials are self-correcting, enabling learners to advance at their own pace (Edwards, 2002).

2.2.2.3 Linking the theory to the study

The Montessori philosophy aligns with the assessment of the quality of early childhood physical environments. The focus on child interests, guided use of materials, and the nurturing of individual development are directly related to the assessment of spatial quality. The Montessori philosophy promotes a child-centred, stimulating, and developmentally appropriate environment that complements the research topic's focus on the quality of physical environments in ECE centres, encompassing indoor space, spatial quality, and facilities.

By applying the principles of Montessori philosophy to the study, it became possible to evaluate how the learning environment in public and private ECE centres align with the child-centred and developmentally appropriate approach advocated by Montessori. The assessment can address aspects such as materials, freedom of choice, and independent movement, and their impact on children's experiences and development.

2.3 Conceptual Framework

The conceptual framework serves as a roadmap for the study, offering a clear structure for data collection, analysis, and interpretation. As the researcher delves into this research, the framework helped uncover insights into how the indoor space, spatial quality, and facilities within ECE centres contribute to the overall quality of the learning environment.

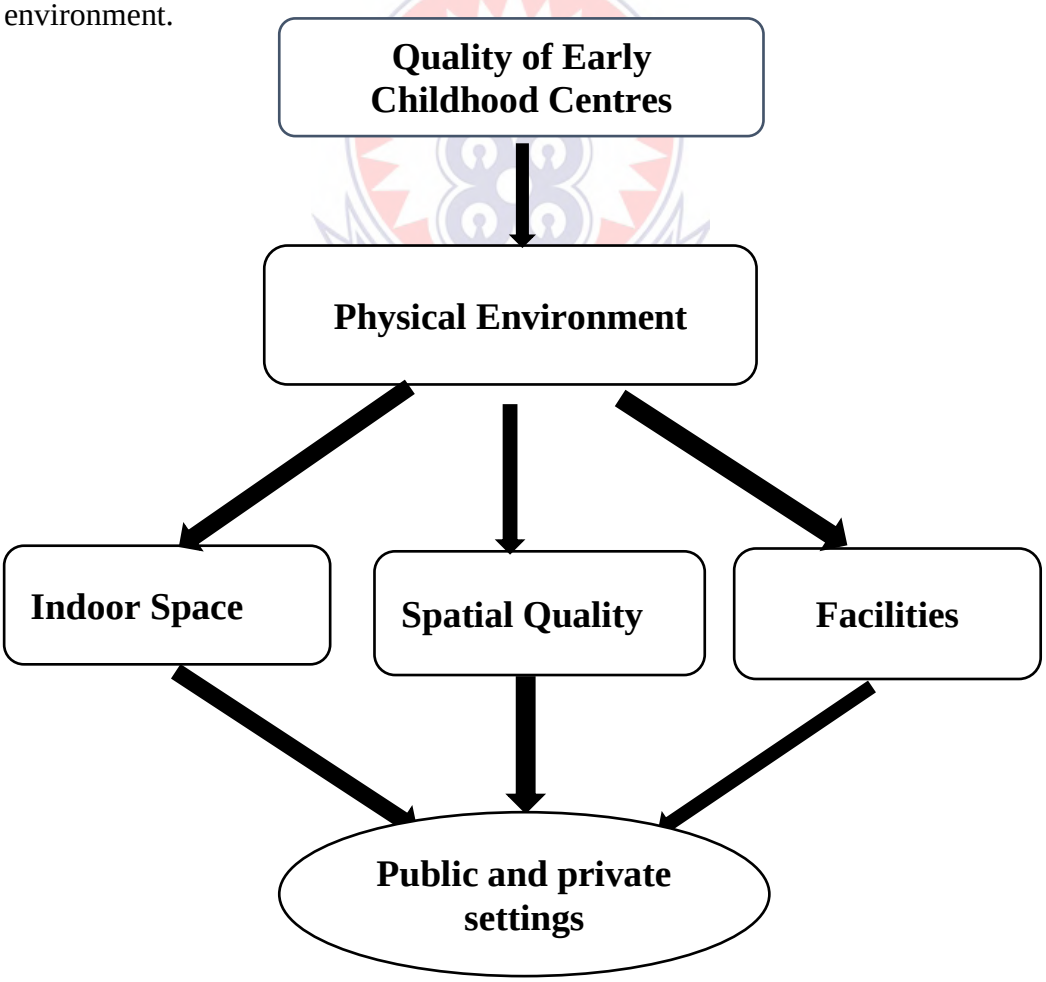

Figure 1: Conceptual Framework on Quality Physical Learning Environments
Source: Construct developed by researcher

The conceptual framework in Figure 1 serves as a visual representation of the key elements and relationships in my study. It outlines the main variables, their interconnections, and how they contribute to the research question or hypothesis. In the researcher's case, the conceptual framework provides insight into the factors that influence the quality of the physical environment in early childhood education (ECE) centres, both in public and private settings.

The cornerstone of the conceptual framework is the independent variable, "Quality." This variable encapsulates various dimensions that collectively define the overall physical environment within ECE centres. It comprises three distinct components:

Indoor space: This component refers to the physical spaces provided within ECE centres for learning activities. It includes considerations like the layout of learning centres, seating arrangements, and how these factors impact young learners' exploration, independence, and freedom of movement. The researcher evaluated how the design and organisation of indoor spaces influence the quality of the learning environment.

Spatial quality: This includes factors such as the use of colour, lighting conditions, ventilation, noise levels, and the selection of materials used within the ECE centres. The research delved into how these elements contribute to the overall quality of the physical environment and its impact on children's experiences.

Facilities: Facilities encompass the amenities and resources provided within ECE centres that are essential for early childhood education. This includes washrooms and hand-washing stations. The researcher investigated how the availability and adequacy

of these facilities contribute to the quality of the physical environment and its suitability for promoting early childhood learning and well-being.

The dependent variable in the conceptual framework is "Public and Private ECE Centres." This variable represents the settings under investigation. The study assessed and compared the quality of the physical environments in these two types of centres and understood how variations in the independent variable impact these settings differently.

The conceptual framework suggested a dynamic relationship between the quality of the physical environment (spatial quality, indoor spaces, and facilities) and the types of ECE centres (public and private). It implies that variations in the quality of the physical environment can have distinct effects on both public and private ECE centres. The interactions between these components are central to the perspective of how the physical environment contributes to the overall learning experiences and outcomes of learners in different settings.

2.4 Developmentally Appropriate Environment (DAE)

Envision a special place where young learners explore, have lots of fun, learn, and grow, just like flowers in a garden. This place is like a playground for their minds and hearts. It's called Early Childhood Education, where learners take their first steps in learning. But how can we make this place perfect for them? Well, that's where the idea of a "Developmentally Appropriate Environment" (DAE) comes into play. It's like making sure everything is just right for each child.

Developmentally Appropriate Environment (DAE) refers to an educational setting that respects and aligns with the developmental stages, needs, and abilities of young learners

(Bredekamp & Copple, 1997). It emphasises the creation of a learning environment where learners can actively engage with materials and activities that suit their readiness levels. This means that a Developmentally Appropriate Environment (DAE) is an educational context deliberately designed to cater to the various stages of growth, requirements, and capabilities of young learners. It signifies a space where learning is tailored to each child's specific developmental stage, ensuring that the content and activities are suitable for their current level of understanding and skill.

This environment recognises the uniqueness of each child's developmental trajectory and supports their growth by creating an environment that both challenges and supports their learning. It acknowledges cultural diversity and promotes active engagement, ensuring that learners can thrive and reach their full potential within a nurturing and well-suited educational context. The principles of a Developmentally Appropriate Environment (DAE) should be embraced and implemented to provide the best learning experiences for young learners in Ghanaian Early Childhood Education (ECE) centres.

In Ghana, ECE and DAE converge to provide a comprehensive educational framework. ECE programs utilise DAE principles to craft learning environments that respect children's developmental milestones, incorporating local traditions and languages to create an enriching atmosphere. Play-based learning, collaborative activities, and guided exploration all form integral components of Ghana's ECE practices, aligning with the tenets of a DAE (Takyi et al., 2021). This combined approach not only prepares Ghana's learners academically but also nurtures their cultural identity and social skills. The synergy between an ECE and a DAE lays the groundwork for multifaceted growth. This nurturing environment becomes the conduit through which learners channel their innate curiosity into meaningful learning experiences. By melding these two pillars, we

foster a generation primed with knowledge, compassion, and an enduring passion for learning.

2.5 Quality Early Childhood Education (QECE)

The concept of quality in Early Childhood Education (ECE) is a complex and highly debated subject, with scholars grappling to find a singular, universal definition. Ball (1994) emphasises the difficulty of finding a single, universal definition for quality in ECE. Brinkman et al. (2017) further explored the complexity of the concept, pointing out that quality in early childhood education depends on several variables. They argue that any definition of quality must encompass characteristics of the classroom and study environment, the attitudes and behaviours of teachers, structural features, and the characteristics of learners and their families.

Allen and Walley (2010) highlighted the challenges in defining quality within the context of early childhood education, emphasising the necessity of considering specific contexts, values, and beliefs about learners and childhood. Waller (2005) contended that quality must be defined in relation to particular contexts, acknowledging diverse values and beliefs about children. Moss et al. (2000) argued that quality is context-specific and culturally relevant, rejecting a narrow view of quality. They assert that what is considered high quality is influenced by the values and priorities of those determining outcomes and structures.

Some scholars argue that guiding laws and policies about quality in ECE often originate from the values of Western cultures, potentially limiting a more diverse understanding of quality (Woodhead, 2006). Katz (1993) offered a specific perspective on defining quality in ECE, suggesting that it can be assessed from various viewpoints: the broader society as observers, learners as active respondents, parents as important stakeholders,

and teachers and other actors in education. Katz argued that considering these perspectives, even if complementary or contradictory, helps develop a holistic understanding of quality that addresses the needs of crucial stakeholders.

The notion of quality in early childhood education (ECE) is inherently subjective, influenced by cultural norms and the diverse interests of stakeholders involved in the educational process. A persistent challenge in the field is the ongoing debate surrounding the establishment of common or universal parameters to define and measure quality in ECE settings. Monney's work in 2007 highlights the complexity of this task, acknowledging the inherent relativity of quality standards. In attempts to quantify and assess quality, various instruments, such as the Classroom Assessment and Scoring System (CLASS), have been developed. However, the pursuit of universally applicable criteria remains elusive. Addressing this challenge, Fourie and Kgalenga conducted a comprehensive study in 2014, focusing on identifying best practices for enhancing the experiential quality of learners in ECE in South Africa. Their findings emphasise the pivotal role of teacher characteristics in shaping the quality of ECE, recognising teachers as crucial determinants in the intellectual, social, and emotional preparation of learners for future development.

Also, from the perspective articulated by Oppong-Frimpong (2021), the concept in question takes on the nuanced and comprehensive interpretation of being "developmentally appropriate." In this context, "developmentally appropriate" denotes an approach to education and child development that is tailored to align seamlessly with the cognitive, social, emotional, and physical stages of a child's growth and maturity. It emphasises a curriculum, teaching methods, and learning materials that are not only age-appropriate but also consider the unique needs, abilities, and interests of each

learner. Oppong-Frimpong's viewpoint suggests an emphasis on an educational framework that is finely attuned to the specific developmental milestones and capacities of learners at various stages of their early years. This perspective underscores the importance of a curriculum and learning environment that fosters not only academic knowledge but also holistic and well-rounded development in alignment with the natural progression of a child's cognitive and emotional growth.

2.6 Ghana's Early Childhood Education Policy Framework

Ghana, like many other countries, recognises the importance of early childhood education (ECE) policies as a vital component of its education system. Research studies (Bertram & Pascal, 2016; Dillard, 2009; Schleicher, 2019; Vandenbroeck, 2020) have emphasised the significance of well-defined ECE policies in providing a legislative framework and direction for early childhood settings. These policies not only govern the provision of care and education services for learners but also outline the roles and responsibilities of educators, parents, and other stakeholders. Ghana's commitment to ECE dates back to its first president, Dr Kwame Nkrumah, who recognised the importance of early childhood and youth in nation-building (Dillard). Over the past decades, ECE programs, services, and practices have evolved and attracted increased attention and support from various stakeholders.

In Ghana, one of the policies that underscore quality physical learning environment in ECE settings is the "National Early Childhood Care and Development Policy" launched in 2005 by the Ministry of Education and the Ministry of Gender, Children, and Social Protection (MoGCSP) which emphasise on the importance of safe, child-friendly, and stimulating learning environments. It guides the provision of care and education services for learners from birth to 8 years (Government of Ghana [ECCD Policy],

2004). The policy acknowledges the interconnections between care and education, emphasising that the development and learning of learners are inseparable (Elliott, 2006; Vandenbroeck, 2020). This recognition places the responsibility of ECE on the government to ensure that parents continue to fulfil their traditional roles of nurturing and taking care of their children.

2.6.1 Child-Friendly Safe Space and Environment (Action Area 5)

Ghana's ECE policy framework, as informed by the Education Sector Plan (ESP: 2018-2030), encompasses various action areas aimed at ensuring quality ECE (Ministry of Education, 2018). One of the pivotal action areas is Action Area 5, which centres on creating child-friendly and safe spaces, particularly emphasising the environment. It recognises that the learning environment significantly impacts a child's development, well-being, and learning experiences. Action Area 5 addresses the need for safe and conducive spaces where young learners can learn, play, and grow.

Ghana's current education policy aims to provide access to all levels of Basic Education, including two years of Kindergarten (KG), as part of its commitment to Free and Compulsory Universal Basic Education (FCUBE). While KG was not initially included as part of Basic Education, the Education Act 2008 (Act 778) officially made it a compulsory component. However, this late inclusion of KG within the Basic Education system in Ghana led to infrastructure deficits in some primary schools. This shortage adversely affected access and participation in KG programs across the country.

Some districts have reported KG class sizes that far exceed the optimal student-to-teacher ratio, with averages of 55 pupils per classroom. In regions such as the Northern Regions, cases of an average of 86 learners per KG classroom have been observed, significantly deviating from the recommended norm. These conditions raised concerns

about the standard of education and learning opportunities for young learners in such overcrowded classrooms.

To address these challenges and align with the objectives of the Education Strategic Plan (ESP), which targets Net Enrolment Ratios (NER) and Gross Enrolment Ratios (GER), the Government of Ghana launched an ambitious plan to address these issues (Ministry of Education, 2018). The plan involves constructing 1,171 KG infrastructures across the country. The primary objective is to ensure that all public primary schools without KG facilities are attached to one. Furthermore, the policy commitment extends to accompanying the construction of primary schools with modern kindergartens that provide an environment conducive to delivering KG education. This policy's commitment to improving the physical environment in KG classrooms complements the researcher's aim to assess and compare the quality of the physical environment in public and private settings, taking into account aspects like indoor space, spatial quality, and facilities.

2.7 Empirical/ Theoretical review

Empirical review in research refers to systematically examining and synthesising existing empirical studies related to a specific topic or research question (Smith, 2018). This process allows researchers to identify patterns, trends, and gaps in the existing literature, helping to build a foundation for their study and refine research questions. By examining and summarising various empirical studies, researchers can derive valuable insights and evidence-based recommendations for their investigations (Smith, 2018).

2.7.1 Indoor space (furniture arrangements and learning centres)

Furniture arrangements

A well-designed quality physical environment in early childhood education, encompassing factors such as class size, lighting, temperature, cleanliness, arrangement, materials, equipment, and security are crucial for ensuring children's comfort, safety, and overall well-being. Extensive research by Barrett et al. (2019) highlighted the significant impact of indoor space on children's well-being, learning outcomes, and social growth. Goss et al. (2017) highlighted the need to account for various structural elements to create a high-quality indoor environment in early childhood education settings.

Farooq (2017) emphasised the link between furniture arrangement and the child's social, ethical, and cognitive growth. Hunzai (2018) stated that classroom quality directly influences students' overall development. Abbott-Shim et al. (2000) underscore the complex impact of classroom quality, including furniture arrangements, academic resources, and a conducive learning environment, on a child's overall development and early educational achievements. Again, scholarly reports, including. Research by Abbas and Ghazali (2010), Abbas et al. (2012) found a positive correlation between Early Childhood Care and Development (ECCD) classroom set-up and children's play behaviour, influencing learning outcomes. The classroom set-up also affects teaching quality and overall child growth (Rentzou, 2011; Maxwell, 2007; Bullard, 2010; Higgins et al., 2005; Proscio et al., 2004; Watson, 2004). Conversely, poor-quality classroom set-ups are associated with psychosocial challenges (Evans, 2006). High-quality ECCD classroom set-ups reduce anxious behaviours in learners (Smith, 2007) and provide crucial opportunities for those from disadvantaged backgrounds (Dearing et al., 2009). These findings underscore the significance of assessing and enhancing the

physical learning environments in early childhood education environments to support optimal child development. However, most of these studies were conducted outside Ghana and did not focus specifically on indoor space, spatial quality, or facilities. This creates a gap that justifies a quantitative, context-based study in the Ho Municipality.

Research has again indicated that when individuals face disadvantages due to their birth environment, positive experiences in Early Childhood Education (ECE) environments can serve as a compensatory factor (Young, 2007; Sylva et al., 2011; Fischer, 2012). Rolnick (2004) emphasised the significant role of quality indoor space in enhancing children's academic adaptability, a crucial aspect for success in primary education and beyond. Findings from neuroscience and child psychology highlight the importance of physical space in fostering children's development and setting the stage for future success in both school and life (Shonkoff & Phillips, 2000; Young, 2007; Fischer, 2012). Research also indicates that learners benefit from improved overall well-being and physical health in preschools with substantial opportunities for indoor play and nature exposure (Fjørtoft, 2004; Wells, 2000). Attendance at "natural" day-care centres is associated with enhanced motor skills, increased attention capacity, and fewer sick days (Bagot, 2005). However, these studies were largely conducted in different cultural and geographical contexts, limiting their applicability to Ghana's early childhood settings. This highlights the need to investigate how indoor space and physical learning environments influence children's development within the context of the Ho Municipality.

Meyer (2009) emphasised that the classroom furniture must align with learners' ages, developmental stages, and individual learning styles for successful outcomes. DeVries and Kohlberg (1987) underscored the crucial role of the teacher-created space in either

fostering or hindering development. The quality of the early years' centre indoor space significantly impacts a child's progress and development (Harms et al., 1998). Also, according to Vygotsky (1986), a stimulating physical environment and classroom setup should offer learners the freedom to play and learn independently, facilitating their educational progress. Again, Cunningham (2012) and Slutsky & Pistorova (2010) contend that thoughtful attention to classroom space can create an environment where learners engage and make use of it as an effective learning resource, thereby enhancing quality early childhood education (ECE). This aligns with the concept of the classroom being termed the "third teacher" (Edwards et al., 1998, p.177). However, in the context of global concerns about ECE quality, developing countries like Ghana face specific challenges related to furniture provision as well as materials needed for effective ECE delivery (UNESCO, 2006; Fourie, 2013; Atmore, 2013). According to UNESCO (2010), there was a lack of Quality Early Childhood Education (QECE) facilities in Sub Sahara Africa (SSA), and Schweisfurth (2011) pointed out inadequate infrastructure as a major challenge to delivery quality ECE in Ghana. While these studies provide valuable insights into the influence of classroom design and furnishings on child development, most were conducted in Western or non-African contexts, where educational infrastructure and resources differ significantly from those in Ghana. This creates a contextual and practical gap, necessitating localised research to understand how classroom space, furniture, and learning environments affect ECE quality within the Ho Municipality’s unique socio-educational setting.

Moreso, Cook-Sather (2002) and Montandon and Osiek (1998) pointed out the limited exploration of children's perspectives on their learning space, emphasising the necessity of understanding how learners perceive the quality of their learning space. Engaging with learners throughout the research process is advocated to gain insights into their

world, interests, and a holistic understanding of childhood. This emphasis on understanding children's perspectives remains essential as educational paradigms continue to evolve. To foster 21st-century responsive classroom environments, collaboration between researchers, educators, and learners is crucial. Acknowledging learners as active respondents empowers them and enhances motivation. Pinter and Zandian (2015) emphasised the importance of incorporating learners' voices throughout the research process, particularly in the design of indoor spaces that facilitate active engagement. Stephenson (2009) advocated reconceptualising learners as powerful social agents, while Grover (2004) underscored viewing learners as experts on their own learning experiences. These perspectives highlight the need for a transformative shift in valuing children's contributions and perspectives in research. UNICEF's interpretation of Article 12 in the Convention on the Rights of the Child asserts that learners have the right to express their opinions, which should be taken into account in decisions affecting them (UNICEF, 2014). Despite the increased involvement of older learners in research by NGOs over the past 15 years, researchers often have less interaction with learners under the age of 8 (Lansdown, 2004). However, these studies reveal a methodological gap, as most focused on older learners and neglected the voices of younger children, particularly those in early childhood education. This limitation underscores the need for context-specific research in settings like the Ho Municipality that integrates the perspectives of young learners. Understanding how children themselves perceive and interact with their learning spaces is essential for designing developmentally appropriate and inclusive classroom environments that truly reflect their needs and experiences.

Furthermore, overcrowding has been identified to hinder effective education and learning practices worldwide. In the United States, challenges stem from population

growth, educator shortages, and reduced support, leading to class sizes exceeding the ideal 15-20 learners (Hachem & Mayor, 2019). Around 17,400 U.S. schools grapple with this challenge. Internationally, the UK is the sole EU nation with overcrowded primary classes, and in Ireland, around two-thirds of primary school students are placed in classes with 25 or more pupils (Donnelly, 2019). In China, a 2015 survey in Shandong revealed over 40% of primary and middle school classes were oversized, with 10% having more than 66% students. In Henan province, China, the average middle school class size in Zhoukou District exceeds 100 students (China, 2016). Chinese education officials define "normal" class sizes as up to 45 students, with classes exceeding 55 considered "large" and over 65 as "super-large" (China, 2018). Fifteen Chinese provinces report an average class size for junior high schools reaching 45, with two provinces exceeding 55 (China, 2018).

Overcrowded classrooms pose a widespread challenge in various African countries, including Nigeria, Kenya, and South Africa, surpassing the ratios recommended by the UN (Motshekga, 2012; Mutisya, 2020; Onwu & Stoffels, 2005). The student-to-teacher ratio for primary education is set at 40:1 (Motshekga; UNESCO Institute for Statistics, 2008), and over 84% of classrooms worldwide have more than 40 students, especially in regions like Sub-Saharan Africa and Asia (UNESCO Institute for Statistics). Despite Ghana's relatively favourable pupil-teacher ratio of 27.25 across primary schools in 2018 (UNESCO Institute for Statistics, 2020), regional variations persist in the national pupil-classroom ratio (PCR), with public elementary schools indicating ratio of 55:1 at the kindergarten level, 38:1 in primary schools, and 35:1 for junior high schools (Ministry of Education, Ghana, 2018). Overcrowded classrooms present substantial challenges to effective teaching, causing issues such as teaching difficulties, disciplinary problems, and appraisal issues for educators (Iqbal & Khan, 2012). Despite

efforts to address these challenges, teachers in public schools, especially in Ghana, continue to face severe problems due to congested classrooms (Amarat, 2011). Learners often experience frustration, withdrawal, and negative attitudes in overcrowded settings, impacting both teachers' confidence and professional satisfaction (Oliver, 2006; Fin, 2003).

In sub-Saharan Africa, including Ghana, early childhood care and education heavily relies on collaborations between public and private early childhood centres, often facilitated by Non-Governmental Organisations (NGOs). Services are provided by various institutions, such as NGOs, religious organisations, communities, and private entrepreneurs, each with diverse motivations (Orkinet al., 2012; Sitati, Ndirangu, Kennedy, and Rapongo, 2016). While some of these Early Childhood Care and Development (ECCD) centres boast favourable conditions, including adequate play and physical facilities, as well as clean and hygienic-sanitary amenities, a considerable number lack the essential environment conducive to effective teaching and learning.

Ghana's educational policies, including the implementation of the School Feeding Programme, distribution of free educational supplies, and the "Free, Compulsory Universal Basic Education", aimed to bridge gender gaps and improve education quality (Thompson & Casely-Hayford, 2014). However, these policies have contributed to increased classroom sizes, exacerbated by inadequate school facilities. Despite progress in education access, challenges persist, hindering the quality learning experience for many learners (Kweitsu, 2019). In the absence of government support, the early childhood education sector relies on individual and non-governmental contributions, as well as unspent capitation grants, to address infrastructure needs (Gyekye-Ampofo and Osei-Poku, 2023). This includes classroom resources, play areas,

furniture, and buildings. Communities, responding to the constitutional call to uphold children's rights, establish numerous ECD facilities, inadvertently placing statutory obligations on the government and highlighting the dual role of these facilities as both educational and sources of livelihood. However, a stark contrast exists as other levels of the public school system receive more substantial support for infrastructure financing, implying a perceived lesser importance or disconnect of the foundation phase from subsequent education levels. Gyekye-Ampofo and Osei-Poku highlighted the need for a more comprehensive and equitable approach to infrastructure support across different educational levels, emphasising the relevance of optimal development in early childhood education (Gyekye-Ampofo and Osei-Poku, 2023; Pardee, 2011).

Furthermore, the impact of overcrowded schools is reflected in lower educational standards and academic performance, particularly in the Accra Metropolis, where initiatives to boost enrolment have led to overpopulated schools, such as New Gbawe Experimental 1 Basic School (Shah & InamuIlah, 2012). Thus, while strides have been made in promoting education in Ghana, the prevalence of overcrowded classrooms remains a significant barrier to quality learning and educational outcomes.

A recent study by Younas et al. (2023) explored the structural dimensions regarding the quality of classrooms in Early Childhood Education (ECE) programs in the province of Punjab, Pakistan. The study focused on factors such as the ratio of teachers to children, and the number of pupils per class, teacher qualifications, and the physical and educational arrangement of classrooms, emphasising their impact on student achievement (Hoy & Spero, 2005). The research highlighted the critical role of structural dimensions in ECE, noting that both the learning environment’s quality and teaching methods greatly impact children’s cognitive, social, emotional, and

behavioural development. High-quality ECE programs, characterised by supportive environments and effective instructional practices, were associated with positive child development. Conversely, low-quality programs lacking resources and utilising ineffective practices had detrimental effects on children's outcomes (Younas et al., 2023). Conducting a comparative analysis of public and private schools in the Punjab province, the researchers employed a causal-comparative approach, examining 200 schools (100 from each sector) through a survey method. Utilising SPSS for data analysis, including t-tests and ANOVA, the study investigated structural dimensions of early childhood education (ECE) quality.

The key findings revealed significant differences regarding structural quality differences in ECE between public and private settings. Private schools consistently scored higher, indicating superior environments for early childhood education. The ANOVA results supported these differences, with private schools demonstrating better facility arrangements. Further analysis focused on physical and academic dimensions. In physical dimensions, private schools significantly outperformed public schools, with a notable gap in the provision of facilities. The comparative analysis of academic dimensions echoed this trend, indicating a substantial difference in the perception of academic facilities, favouring private schools. These findings, grounded in the works of Wortham (1998), Golm (2020), Carter (2020), and Abbott-Shim et al. (2000), underscore the consistent superiority of private schools in ECE structural dimensions. The implications for policymakers, educators, and parents emphasise the need for targeted interventions to enhance the quality of early childhood education in public schools.

Another study by Robson and Mastrangelo (2017), explored how kindergarten children, influenced by the Reggio Emilia principle, perceived their classroom as the "third teacher" facilitating their learning in Ontario, Canada. The evolving world and the need for education to be responsive to the 21st century's diverse student population were highlighted by Cook-Sather (2002) and the Ontario Ministry of Education (2016). Despite shifts towards child-centred and inquiry-based education, it is crucial to ensure that learning environments align with these approaches.

The study employed a qualitative phenomenological approach, allowing 16 female learners in a Reggio-inspired senior kindergarten program to express their perspectives without external influence. The children, acting as co-researchers, provided insights into their perceptions of the classroom as a crucial element in their learning experiences. The qualitative analysis revealed that learners view their classroom environment as a dynamic space contributing to learning, aligning with the Reggio Emilia principle of the environment as the "third teacher." Their descriptions highlighted various aspects, including learning through materials, imaginative play, real-life connections, peer communication, and exploration of classroom documentation (Grover, 2004). Overall, the study emphasises the nuanced ways in which learners actively engage with and benefit from their physical environment in a Reggio-inspired school.

Again, Amissah-Essel et al. (2020) assessed the quality of physical environments in early childhood schools in the Cape Coast Metropolis, Ghana. The objective of this study was to evaluate the quality of physical environments in Early Childhood Care and Development (ECCD) centres in the Cape Coast Metropolis, Ghana, and to investigate whether the status of being a private or public centre is linked to the quality of the physical environment. Additionally, the study explored educators' perceptions

regarding the significance of the physical environment in influencing children's developmental outcomes. Employing a sequential explanatory mixed-methods research design, all 160 ECCD centres in the Cape Coast Metropolis underwent assessment using a modified version of the Children's Physical Environment Rating Scale (CPERS) and a semi-structured interview guide. Descriptive statistics revealed that more than half (56%) of the ECCD centres were rated as "fair" in terms of the quality of their physical environment. The study found no significant association between public or private status and physical environment quality. Qualitative insights highlighted funding shortages and lack of governmental support as reasons for subpar play yards. The study suggests compromised physical environments in ECCD centres and recommends collaborative efforts from stakeholders to enhance quality, provide financial support, and offer in-service training for educators.

A subsequent qualitative investigation identified two primary themes explaining the subpar quality of play yards in early year's schools: "lack of funding" and "governmental support." The findings suggest a compromise in the physical environments of ECCD centres. Stakeholders, including the Ghana Education Service, Non-Governmental/Religious Organisations, and private entrepreneurs, are urged to collaborate in enhancing the quality of physical environments and providing financial support for essential equipment, such as learning materials, in both private and public ECCD centres in the Cape Coast Metropolis.

Furthermore, Osai et al. (2021) examined how teachers experienced overcrowded classrooms in a basic school setting in Ghana. The research focused on the new Gbawe Experimental 1 Basic School, located in the Greater Accra region. A quantitative method was used, with a case study design guiding the inquiry. Data collection involved

the use of unstructured questionnaires and teacher observations. The overall findings of the investigation reveal that educators perceive overcrowded classrooms as a source of stress. Teachers articulated specific instances within overcrowded classrooms that they identified as stressful. Among these were inadequacies in the learning environment, concerns related to safety and health, reduced teacher-student interaction, disruptive behaviour among students, emotional and psychological stress for teachers, heavier workloads, and limited instructional time. These difficulties were attributed to factors such as inadequate administrative backing, poor implementation of policies, insufficient teacher training and professional development, as well as a lack of teaching resources. Despite these challenges, educators indicated that they resort to improvisation as a coping mechanism in handling overcrowded classrooms.

Oppong-Frimpong (2019) also conducted a study that focused on the role of physical classroom setting as a "third teacher" in the delivery of early childhood education in the Ga-West Municipality, Ghana. The study aimed to assess the state of the classroom environment in Early Childhood Education centres within Ghana's Ga West Municipality, with emphasis on its function as a "third teacher" in promoting quality ECE delivery. A convergent mixed methods design was employed, data from 142 respondents, including ECE coordinators, teachers, and head teachers, revealed infrastructural challenges such as inappropriate furniture, under-resourced learning centres, and overcrowded classrooms. These issues hindered teachers' ability to implement training effectively and limited the classroom environment's potential impact on children's learning. This study aligns with existing literature emphasising the importance of a supportive learning environment in early childhood (Oppong-Frimpong; Young, 2007; Sylva et al., 2011; Fischer, 2012; Rolnick, 2004; Shonkoff & Phillips, 2000).

Another study by Gyekye-Ampofo and Osei-Poku in 2023 examined the infrastructure design gap in early childhood care and education in Ghana, focusing on public preschools in the Ashanti Region. The research underscores the impracticality of expecting early childhood development facilities to meet specified standards without a dedicated government program for financing and support. Pardee (2011) added that the absence of such a program contributes to challenges in achieving well-equipped and structured facilities. This study employed descriptive research methods, including interviews and questionnaires, to investigate the infrastructural gap in early childhood education in selected public kindergarten schools in the Ashanti Region. A purposive sampling method involved 30 teachers from 15 schools. The research focused on examining resources in both buildings and classrooms. Data analysis aimed to highlight the experiences of children, particularly about play facilities, considering their social and economic backgrounds. The study aimed to establish connections between these aspects and the cognitive and social competencies of learners in public schools in the Ashanti Region.

The findings, derived from a combination of interviews and questionnaires, indicated significant deficiencies in the infrastructure of public kindergarten schools in Ghana. A notable revelation was the prevalent weakness and poor design of most structures. The inadequacy of resources within the Ghanaian education system, specifically in terms of funding for constructing and maintaining early childhood education (ECE) infrastructure, was underscored. The facilities were described as unstructured and highly fragmented, resulting in substandard learning environments with inadequate play areas, furniture, and learning resources. Approximately 67% of the school blocks were deemed not child-friendly due to structural issues and design flaws.

The buildings housing the learners were found to be in suboptimal condition, lacking essential features such as windows and doors. Additionally, issues like dusty floors, leaking roofs, and structural defects with exposed iron rods were identified during visits. A concerning observation was the absence of child-friendly furniture in many classrooms, with a significant number featuring individual tables and chairs or dual desks. In some instances, pupils were found sitting on the bare floor, an arrangement that is not conducive to developing psychosocial domains during the early learning period. The study emphasised the negative impact of the observed furniture on children's posture, physical development, and learning capacity. Furthermore, it revealed a severe lack of interactive resources in the kindergarten classrooms studied. The overall crowded design of the classrooms was noted as detrimental to effective teaching and manipulative skills training.

Also, the study unexpectedly uncovered potential hazards in Early Childhood Settings, emphasising the need for attention to prevent injuries, with solutions that are easy to implement without significant capital investments. It highlighted the importance of addressing poor ventilation, particularly concerning the higher risk for young learners due to their increased air intake. The study stressed that learners with chronic health conditions, like asthma, are more susceptible to the adverse effects of poor indoor air quality, making ventilation improvements a top priority for overall child health.

Learning Centres

The physical environment and available resources, including space, furniture, tools, and materials, play a crucial role in supporting children's development. Research indicates that the design and layout of preschool environments significantly impact learning, behaviour, and creativity (Dearing et al., 2009). An intercultural study highlights the

variability in learning conditions based on the physical aspects of the school (Sheridan et al., 2009). Also, ensuring a high standard of education involves providing rich learning centres to foster children's growth across various domains (MoNE, 2013).

Furthermore, an efficiently organised learning environment in preschool education not only allows for increased classroom interactions (OECD, 2006; UNESCO, 2005) but also positively contributes to children's development (Burchinal et al., 2000; Howes et al., 2008; Sabol et al., 2013). Given that learners undergo development influenced by their surroundings, the careful arrangement of the learning environment especially the learning centres becomes crucial.

Again, a well-designed physical environment in education promotes active learning experiences and cultivates creative problem-solving skills among learners (Moore, 1987). Consequently, a meticulously planned classroom environment gains significance in achieving program goals. Specifically, in preschool classroom environments, the establishment of learning centres within classrooms holds particular importance in attaining program objectives. Learning centres are delineated as designated areas equipped with diverse materials, such as cabinets, shelves, panels, colourful carpets, floorings, or taped sections. These centres house a variety of materials selected in alignment with program objectives, enabling learners to engage in individual or group activities (Beaty, 2013; Diffily et al., 2001; MoNE, 2013; Pool & Carter, 2011; Prevost, 2003). Simply put, learning centres can be conceptualized as spaces within the classroom where learning activities and experiences unfold (Sanoff, 1995).

The establishment of a physical environment through learning centres in preschool classrooms serves to address the educational needs of children, fostering both individual and group learning experiences. Given the substantial impact of the learning

environment on the socio-emotional, physical, and cognitive development of learners (Bekman, 1982; Burchinal & Cryer, 2003; Ceglowski & Bacigalupa, 2002; Feyman, 2006; Kağıtçıbaşı et al., 1988; Yalçın, 2011), the Organisation and utilization of learning centres emerge as crucial elements in creating an effective learning atmosphere. Numerous studies have explored teachers' perspectives, recognising their pivotal role in shaping and implementing learning environments (Aysu & Aral, 2016; Çakır, 2011; Durmuşoğlu, 2008; Erşan, 2011; Ögelman, 2014; Ögelman & Karakuzu, 2016; Özyürek & Aydoğan, 2011; Parlakyıldız & Aydın, 2004; Tu, 2006; Ulutaş & Demiriz, 2006; Öncü Celebi, 2015, 2017; Yoleri & Tetik, 2018). A comprehensive review of these findings underscores the significant role teacher's play in crafting an effective learning environment. Teachers, as key architects of this environment, hold a significant responsibility in shaping and implementing learning spaces that provides a foundation for exploration, independence, and freedom of movement that contribute to the holistic development of young learners.

Karlıdağ (2021) explored creating learning environments in preschool classrooms: perspectives of pre-service preschool teachers in Yazgat, Turkey. The research aims to explore the perspectives of 35 pre-service preschool teachers on establishing learning environments in preschool classrooms, utilising qualitative research methods. The study gathered data through semi-structured interviews, and the findings were analysed using content analysis. The research identified two main themes within the learning environment category: Characteristics of Learning Environment and Learning Centres. Characteristics of the learning environment encompassed both physical and educational features. The Learning Centres theme included sub-themes such as the importance, planning, and utilization of learning centres.

Respondents emphasised the necessity of specific features in the learning environment to support holistic child development. They highlighted both physical and educational aspects, suggesting that the environment should include diverse and sensory-rich concrete materials tailored to the children's age and developmental stage, ensuring safety and easy accessibility. Respondents advocated for an adequately sized, clean, and well-qualified learning environment, addressing factors like temperature, light, sound, and ventilation.

The respondents expressed the need for various learning centres within the preschool environment to diversify children's learning experiences and meet individual differences, interests, and needs. They envisioned an effective learning environment as one that inspires curiosity, provides concrete learning experiences, and supports all facets of child development, enabling learners to express themselves comfortably and freely.

2.7.2 Spatial quality (noise level, ventilation, room design [light and colour], and TLRs)

Spatial quality refers to the characteristics and features of physical spaces that contribute to the overall educational experience (Berris and Miller, 2011 & Maxwell, 2007). It encompasses various elements that collectively contribute to the atmosphere and functionality of a space, impacting how individuals engage with and perceive their surroundings within an educational setting. Spatial quality in early childhood education holds significant importance as it profoundly shapes the learning experiences and development of young children. An environment with thoughtful spatial design positively impacts concentration, exploration, and active participation in educational activities (Quartey et al., 2024). This design addresses sensory stimulation, emphasising

the crucial role of colours, lighting, ventilation, and learning materials in fostering cognitive and emotional growth.

Emphasising the significance of indoor environments and spatial quality, the World Health Organisation (WHO) has highlighted them as a health concern, particularly considering that learners spend up to 85% of their time indoors (Lum et al., 2013; Islam et al., 2024; Barreira et al., 2024). The vulnerability of younger learners to indoor environmental effects is underscored by their faster breathing rates, larger lung proportions, rapid growth, and underdeveloped bodies, including eyes, respiratory, and immune systems (Bennett et al., 2008; Branco et al., 2015; Barreira et al., 2024; Fuentes-Leonarte et al., 2009; Tomita et al., 1989).

Research globally, including studies from Holland (de Waard & Zeiler, 2014), Korea (Kabir et al., 2012), Portugal (Branco et al., 2015; Oliveira et al., 2017), Malaysia (Salleh, Salim, & Kamaruzzaman, 2016), and the United States of America (Satterlee et al., 2015), has consistently identified that Indoor Environmental Quality (IEQ) factors involving colour, light, noise, and ventilation (Berris and Miller, 2011; & Maxwell, 2007) in Early Childhood Education (ECE) often fall below minimum regulated standards.

In Ghana, despite the government's commitment in 1995 to provide Free Compulsory Universal Basic Education (FCUBE) by 2005, aiming for an 11-year education system comprising two years of kindergarten, six years of primary school (Grades 1 - 6), and three years of junior high school (JHS 1 - 3), challenges pertaining provision of adequate spatial quality remained (Berris and Miller, 2011). The 2004 education reforms introduced the "capitation grant," an innovative financing mechanism designed to eliminate all school fees, expand Early Childhood Education services, improve

gender parity, and introduce government-sponsored nutrition and school feeding programs. Although these reforms led to improved general enrolment levels, challenges persisted in poor communities due to issues such as corruption, poor record-keeping, and resource misappropriation (Lewis et al., 2009).

Even with the implementation of the capitation grant, schools in impoverished urban communities in Accra, particularly in the Zongo communities, faced significant challenges (Ayele et al., 2015). These challenges included structural decay, overcrowding, a lack of school materials, inadequate ventilation, and poor room designs (Nguyen et al., 2024). Recognising the enduring nature of these issues, Ayele et al., surveyed primary and junior high schools in the East and North Ayawaso Submetros to assess the condition of local schools and the availability of learning materials in the Zongo communities. The quality of school facilities, encompassing aspects like buildings, room design, sanitation, electricity, waste management logistics, and essential school materials such as libraries, textbooks, desks, and chalkboards, holds significant sway over the quality of education imparted to learners. A deficiency in resources such as desks, textbooks, libraries, science labs, and audio-visual aids in schools poses a clear threat to the effectiveness of teachers and, consequently, the future success of students (Ayele et al., 2015).

Furthermore, according to constructivist theorists such as Dewey (1966), Chand (1995), and Vygotsky (1978), as well as findings from Evans et al. (2000), Ajayi (2007), Oppong-Frimpong (2017), and Papadakis et al. (2016, 2018), TLMs and the nature of children's engagement with them are critical contributors to Quality Early Childhood Education (QECE). A study conducted by Oppong-Frimpong (2021) highlights the crucial role of TLMs in providing QECE. The professional utilisation of TLMs by

teachers, coupled with the opportunities for learners to interact with them, significantly influences the quality of learning in ECE settings (Papadakis et al., 2020; Yavuz and Güzel, 2020). Ajayi (2007) particularly highlighted the importance of textbooks and instructional materials in achieving lesson objectives, reinforcing the notion that TLMs significantly influence the structure and direction of the educational setting.

Kisitu (2008), referencing the New Jersey State Department of Education, underscores the importance of Teaching and Learning Materials (TLMs) in providing hands-on experiences that enhance children's knowledge and skills. Evans et al. (2000) argue that children, especially those under eight, learn best through manipulative materials, a sentiment echoed by Dewey (1966), who emphasises the value of experiential learning for genuine knowledge acquisition. Yavuz and Güzel (2020) support the idea that hands-on activities contribute to improved learning outcomes. These perspectives imply that the success of the teaching and learning process is closely tied to the availability and effective use of resources. In particular, inadequate textbooks can undermine the standard of Early Childhood Education (ECE) delivery in Ghana, emphasising that a well-trained ECE teacher may face limitations in facilitating interactive teaching and learning processes due to resource constraints.

Nevertheless, Oppong-Frimpong (2017) contended that the meaningful utilization of Teaching and Learning Materials (TLMs) by teachers, along with their ability to establish an appropriate environment and opportunities for learners to access and interact with these TLMs, is crucial for ensuring the provision of Quality Early Childhood Education (QECE). The argument posits that the mere presence of TLMs, while restricted to teacher manipulation during the teaching and learning process, may not truly contribute to QECE if learners lack direct access to and manipulation of these

materials. Thus, the availability and accessibility of TLMs play a pivotal role in QECE provision in the Ghanaian context. Consequently, learners' capacity to engage and interact with TLMs becomes a crucial factor in determining the quality of early childhood education outcomes (Papadakis et al., 2018, 2016; Papadakis et al., 2020).

Another noteworthy consideration is the perception that teachers hold regarding the roles of TLMs and interaction in ensuring QECE. It is argued that teachers' views on the concept significantly influence their dedication to implementing, using, defending, or presenting it. For example, if teachers believe that TLMs, coupled with active learner involvement, are paramount for QECE provision, they are more likely to prioritize the provision of necessary TLMs and enable learners to manipulate them for effective learning outcomes (Yavuz and Güzel, 2020).

Moreso, spatial quality goes beyond aesthetics; it deeply influences the cognitive and emotional development of young learners. A thoughtfully designed environment, considering elements like acoustic, colours, lighting, ventilation, and TLRS, can enhance concentration, encourage exploration, and foster active participation in learners (Nguyen et al., 2024).

Flood (2019) explored the evaluation of indoor environmental quality (IEQ) in early childhood education centres in New Zealand. The specific focus of Flood's study included three key indoor environmental factors: Indoor Air Quality (IAQ), lighting conditions, and sound. The results revealed a lack of indoor environment quality standards in early childhood education. Mean carbon dioxide levels in 75% of the sleep rooms monitored exceeded the standards set by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and the Ministry of Education guidelines. Additionally, the mechanical ventilation in one of the centres did

not meet the New Zealand mechanical ventilation standard. The thermal comfort range exceeded 14% of the time during operating hours.

Moreover, the maximum relative humidity guideline, as stipulated by ASHRAE and recommended in New Zealand schools, was exceeded 29% of the time during operating hours and 66% of the time outside operating hours. This could potentially support mould and bacterial growth. Building audits identified poor cleaning routines in most rooms. Only 22% of the classrooms met the New Zealand building code's G7 standards for natural light, and 55% had poor views of the outside, as also required under G7. None of the classrooms achieved a daylight factor greater than 2%, as set out in the Ministry of Education school guidelines. Additionally, 33% of the classrooms' interior lighting met New Zealand interior and workplace lighting standards. Those classrooms with mostly hard floors and ceilings have potential reverberation issues

The study underscores the necessity for further research to delve into the ventilation specifications in sleep rooms and the criteria for natural light, outdoor views, and interior lighting within early childhood classrooms. It recommends that the Ministry of Education and Ministry of Health should offer guidance and counsel before the construction of a centre, emphasising the consideration of indoor environmental quality assessment as a component of a centre's Education Review Office evaluation. Additionally, it suggests that the significance of indoor environmental quality should be integrated into the curriculum for the training of early learning teachers.

Another study by Ayele et al. (2015) investigated education infrastructure challenges in East and North Ayawaso Sub-Metros, focusing on the persistent disparities in educational quality and access in Ghana despite ongoing governmental reforms and policies. The data collected indicates that schools in the study area encounter significant

challenges in providing sufficient facilities and materials for their students. Notably, all public schools surveyed lacked an adequate number of desks, leading to a situation where, in most classrooms, two students share a desk. Beyond desk shortages, primary education quality in the East and North Ayawaso Sub-Metro communities is further compromised by a lack of textbooks, maps, libraries, and similar resources. While Ghanaian schools typically provide free textbooks for the core subjects—English, Math, and Science— the study area schools reported having an insufficient number of textbooks for students. On average, the textbook-to-student ratio is 1:2, and 43 percent of schools reported providing workbooks to students at no cost or with minimal mark-up.

Many of the schools' exhibit signs of neglect, appearing as though no repairs have been undertaken since their construction. Observable issues include peeling wall paint, leaking ceilings, and broken windows and doors, creating an environment that is particularly unfavourable for effective learning (Ayele et al., 2015).

Although commendable progress has been made in increasing enrolments for both girls and boys in low-income communities within Accra's East and North Ayawaso Sub-Metros, the findings from this survey underscore the necessity for ongoing efforts. This report unequivocally emphasises the urgency of interventions aimed at addressing overcrowded conditions, improving school record-keeping, implementing effective waste management strategies, ensuring access to reliable and high-quality water, providing proper sanitation facilities (including private, sex-segregated toilets), and enhancing the availability of learning materials throughout all schools in the study area (Ayele et al., 2015).

Oppong-Frimpong (2021) conducted a study on the role of teaching and learning materials and interaction as a tool for quality early childhood education in Agona East District of the Central Region of Ghana. In this context, TLMs encompass teaching aids such as textbooks, workbooks, crayons, and pieces of cardboard that facilitate the teaching and learning process. Interaction refers to the opportunities learners have to physically engage with these TLMs, enhancing their learning experiences.

Utilising a case study design, data was gathered through interviews and observations from twelve Early Childhood Education schools in the Agona East District of the Central Region of Ghana, involving twelve head teachers, totalling twenty-four participants. The results of the investigation indicate that the respondents recognised Teaching and Learning Materials (TLMs) as a crucial factor in ensuring the provision of Quality Early Childhood Education (QECE). However, it was noted that TLMs were not readily available, thereby limiting children's interaction with them. The study highlighted that the absence of TLMs posed a hindrance to children's access to active engagement with these materials. Furthermore, the findings revealed that the lack of availability and accessibility of TLMs diminished the prominence of interaction in the provision of Early Childhood Education (ECE).

In light of these findings, it is recommended that both teachers and ECE providers take measures to ensure the availability and accessibility of TLMs to facilitate active interaction among learners. The study suggests that teachers should explore innovative ways of creating and developing TLMs using local resources. Additionally, there is an emphasis on encouraging children’s active interaction with TLR’s, as this is considered a key avenue for facilitating meaningful learning. As a researcher, it is imperative to underscore the significance of these findings in emphasising the critical role TLMs play

in shaping the standard of early childhood education. The study's recommendations align with the broader understanding that a well-equipped and interactive learning environment positively influences children's educational experiences. Therefore, efforts to enhance the availability, accessibility, and creative utilization of TLMs should be a priority in ECE settings.

2.7.3 Facilities (washrooms and hand-washing stations)

Globally, data from a UNICEF publication revealed that sub-Saharan African countries exhibited the lowest sanitation coverage in schools (Anon, 2015). Notably, Tanzania reported the most deficient toilet coverage in schools, with only one in ten schools equipped with adequate facilities. Between 2008 and 2013, countries like Rwanda, Zimbabwe, and South Sudan experienced a decline in school toilet coverage. Furthermore, a 2012 report on Sierra Leone highlighted the absence of toilets in most rural schools, with a lack of separate facilities for girls and boys, leading to potential hindrances for girls attending schools and an increased risk of dropout (Sesay and Leone, 2013). This situation became even more critical with the 2012 implementation of a universal primary education policy, which was anticipated to exacerbate the dropout rates among adolescent girls.

For an optimal educational environment, schools must ensure an adequate supply of clean water for drinking, hand-washing, and cleaning to safeguard the health and well-being of both students and staff. Research has consistently highlighted that schools equipped with safe and sufficient water and sanitation facilities witness a reduction in health-related student absenteeism (UNICEF, 2017). The World Health Organisation (WHO) guidelines recommend a specific ratio of toilets to students, emphasising the importance of proper sanitation. However, Amankwah-Kuffour et al. (2023) reveal

instances where schools lack a reliable source of drinking water and/or adequate sanitation facilities. In Ghanaian schools, faecal matter management technologies such as KVIP, water closets, pit latrines, "aqua-privies," and bio-fill toilets are utilised, while open defecation remains a common and "unimproved" practice in both rural and urban settings (Appiah-Effah et al., 2022). The prevalence of these technologies varies, with septic tanks, KVIP, and pit latrines being more common in rural schools, while urban schools predominantly employ water closets (WC) and "aqua-privy" facilities. Open defecation, lacking proper separation between humans and faecal contact, is considered "unimproved" according to Joint Monitoring Progress (JMP) standards (Karnib, 2014). The JMP standard for "improved" sanitation facilities requires exclusive use by a single household, a criterion not met by most basic schools in Ghana, where more than 50 pupils often share one squat hole (JMP, 2010). Improved sanitation, defined by JMP, involves the disposal of excreta in a manner that minimizes the risk of faecal-oral transmission to users and the environment. Recognised types of improved sanitation facilities include flush or pour-flush latrines, pit latrines with a slab, ventilated improved pit (VIP) toilets, and composting toilets (Karnib, 2014; Quartey et al., 2024).

The provision of adequate toilet facilities in Ghanaian basic schools faces significant challenges attributed to initiatives like the free compulsory universal basic education (FCUBE), the school feeding program, and the free school uniform concept (MOE, 2009; Duah, 2024), which have led to increased enrolment in basic schools. According to a 2017 report from the Education Management Information System (EMIS), around 74,000 out of 21,438 public basic schools in Ghana lack proper toilet facilities, affecting over two million learners who resort to open defecation in the vicinity of their schools. Additionally, among 9,604 private basic schools, more than 1,631 lack toilets, impacting an estimated 430,000 pupils who defecate outdoors during school hours

(Inusah et al., 2023). The inadequate provision of toilet facilities in Ghana's basic schools' stems from challenges faced by the Ghana Education Service (GES), a Ministry of Education agency. Coordination issues led to Stakeholders and Donor Agencies implementing disparate standards, resulting in inappropriate facilities that fail to align with pupils' defecation preferences, age, and gender (Adjibolosoo et al., 2019). Despite having facilities, pupils often resort to open defecation due to mismatched infrastructure. Some communities lack toilets, causing shared facilities with schools and increased pressure on existing resources (GNA Report, 2015; Adjibolosoo et al., 2019). The GES, working through the MMDAs, struggles to keep up with the rising demand for sanitation facilities, leading to queues at limited toilets and students seeking alternative defecation sites like bushes, forests, beaches, and drains (GNA Report, 2015; Osafo-Adu & Wereko, 2024).

Furthermore, hand washing stations considered a crucial aspect of facilities, play a significant role in preventing the transmission of communicable diseases such as cholera, influenza, and pneumonia (Najnin et al., 2017; Wichaidit et al., 2019; Rahman-Zuthi et al., 2022). The recognition of handwashing as an effective measure underscores its importance in maintaining public health and mitigating the spread of infectious diseases. Ensuring an adequate supply of water, soap, towels/tissues, and alcohol-based hand sanitisers is crucial for promoting students' health by curbing the spread of infectious diseases (Zivich et al., 2018; Hadaway, 2020; Leslie et al., 2021). However, insufficient provision of handwashing facilities heightens the risk of contracting infectious diseases through various pathogenic organisms (Leslie et al.).

In the context of basic schools, many developing countries, especially in sub-Saharan Africa, face challenges in providing standard handwashing facilities. In these regions,

the recommended practice is to perform handwashing under running water for at least 20 seconds, five times a day. Economic constraints, individuals' socio-economic conditions and inconsistent water supply are cited as significant impediments to the provision of adequate handwashing facilities. Unfortunately, these challenges often compete with other essential needs such as road infrastructure and healthcare (Amuakwa-Mensah et al., 2021). Following the onset of the Covid-19 pandemic, concerns regarding handwashing practices in elementary schools have been raised. In Indonesia's primary school 101893 Bangun Rejo, a study revealed that handwashing with soap was below 50% and considered insufficient (Wichaidit et al., 2019). A comprehensive assessment in northeast China found that none of the primary school students completed all recommended WHO steps for handwashing (Hao et al., 2021). Similarly, in Mongolian elementary schools, students displayed poor handwashing habits during crucial moments, coupled with inadequate facilities and soap availability (Enkhbat et al., 2022). An analysis in South Ethiopia's Damote Woide district indicated a low rate (28.10%) of proper handwashing practices among primary school students, posing infection risks (Admasie et al., 2022). Several studies consistently report suboptimal handwashing practices, insufficient facilities, and a lack of emphasis on hand hygiene education in elementary schools (Muramatsu-Noguchi et al., 2022; Sharma & Adhikari, 2022; Saima-Alam et al., 2020; Okello et al., 2019; Steenkamp et al., 2022; McMichael, 2019; Otto et al., 2022; Eshetu et al., 2020; Toleubekov et al., 2022).

Ghana, classified as a developing nation, faced the impact of the COVID-19 pandemic, necessitating the provision of handwashing facilities in schools, particularly at the basic level. Preceding the pandemic, there existed documented instances of inadequate handwashing facilities in Ghana's basic schools. A study by Acheampong et al. (2019)

revealed that 67% of students lacked proper drying materials, leading them to use their soiled school uniforms for hand cleaning after washing. Additionally, some students exhibited suboptimal handwashing practices (Dajaan et al., 2018). Steiner-Asiedu et al. (2011) reported that the absence of essential resources such as soap, water, and disposable tissues posed barriers to effective handwashing. Pertaining specifically to Northern Ghana, particularly within Zabzugu district, it was found that although 92% of primary schools had handwashing facilities, they were underutilised due to factors such as lack of awareness and poor handwashing habits (Tiswin et al., 2019; Dajaan et al., 2018; Appiah-Brempong et al., 2018).

Again, the evaluation of handwashing awareness and techniques in Kintampo Municipality's elementary schools revealed a deficiency in handwashing at crucial moments. Notably, 60.12% of students neglected handwashing after using the toilet, approximately 15% washed their hands under clean flowing water, and merely 23.33% exhibited knowledge of effective handwashing (Dajaan et al., 2018). Barriers such as insufficient supply of water and soap hindered handwashing efforts. Amid the COVID-19 outbreak, there were concerted efforts by the government and private Organisations to supply handwashing facilities to schools, including primary and lower-level schools. Additionally, educational initiatives on handwashing were strengthened through the National Commission for Civic Education (NCCE). According to Kojo Abanyie et al. (2021), a concerning 75.9% of basic schools in the Wa Municipality lacked handwashing facilities, exposing students to the risk of infections. The mismatch between existing facilities and learners' preferences, age, and gender further emphasises the importance of inclusive infrastructure planning. Moreover, there is a need for urgent attention to provide sufficient handwashing facilities and promote proper hygiene practices. Addressing these challenges requires not only infrastructural

improvements but also strategic coordination among stakeholders, policymakers, and communities to ensure the effectiveness and sustainability of sanitation facilities in educational settings.

Research conducted by Adjibolosoo et al. (2019) investigated the conditions of toilet facilities in selected basic schools in the Eastern and Volta Regions of Ghana. Employing a mixed-methods approach, the study collected self-reported data on school toilet conditions from 400 pupils and 45 teachers through structured questionnaires, focus group discussions, and checklist observations.

The quantitative data, analysed using descriptive statistics and the Chi-square test, along with qualitative data analysed through thematic content analysis, revealed that both pupils and teachers perceived the conditions of toilet facilities in the basic schools as very poor. The identified issues included inadequacy, lack of privacy, poor ventilation, inappropriate squat hole sizes, encroachment by the community and rodents, and improper location of school toilets. These situational factors were found to be both policy and situation-driven, raising questions about the attention given by the Ministry of Local Government and Rural Development (MLGRD), Ministry of Education (MOE), and Ghana Education Service (GES) to the health and environmental implications of school toilet conditions. The study highlighted a significant correlation between pupils' perceptions and poor school toilet quality. Analysis of variance revealed statistically significant mean differences in teachers' perceptions regarding pupils queuing for toilet use, privacy of toilets for both sexes and appropriateness of toilet squat holes. Recommendations include establishing sanitation standards, implementing a national policy for decent toilet facilities, and implementing a strong monitoring system. Teachers are also urged to educate students on proper toilet use.

Another study was conducted by Amankwah Kuffour et al. (2023) on the Evaluation of Handwashing Facilities in Basic Schools within the Ejura Sekyeredumase Municipality in Ghana. This investigation aimed to gain insights into the state of handwashing facilities, students' knowledge, and their utilization of these facilities in basic schools within the municipality, prompted by the onset of the Covid-19 pandemic. The study specifically addressed the condition of handwashing facilities and the level of knowledge regarding proper handwashing in the second Covid-19 hotspot region. The study, conducted from November 2019 to March 2020, utilised structured questionnaires, observation checklists, and interviews. Out of 30 selected schools (25 public and 5 private), 600 respondents, including students and teachers, were randomly and purposively sampled. The findings revealed inadequate handwashing facilities for students and teachers. Despite a majority of students (66.70%) rating the availability of handwashing materials as good, there was a significant relationship ($p<0.05$) between material availability and facility patronage. Most students (76.80%) reported regular handwashing with soap and water after using the toilet. A notable finding was a significant association between students' understanding of germs and their handwashing frequency, even though the impact observed was minimal.

Challenges to effective handwashing included insufficient materials (42.13%) and student forgetfulness (37.07%). The study recommended continuous government support, led by the Ministry of Education, to ensure year-round provision of handwashing facilities and materials, alongside ongoing education and awareness initiatives to enhance handwashing habits among students.

2.7.4 Strategies that can be adopted to improve the Quality of the Physical Environment

The principles of the Reggio Emilia approach can be applied by creating inspiring indoor spaces. These spaces should be flexible, allowing easy reconfiguration to support different learning activities (Hall et al., 2014). For example, furniture can be designed to be moveable, enabling educators to adapt the space for group discussions, independent play, or collaborative projects enhancing their freedom of movement and decision-making. An open layout design ensures visibility and accessibility, allowing educators to maintain supervision while enabling learners to move around freely (Strong-Wilson & Ellis, 2007; Thornton & Brunton, 2007; Wurm, 2005, Wien, 2008). This can be achieved by arranging child-sized furniture and learning materials to offer ample space for movement (Lash, 2008). For instance, child-sized tables and chairs can be placed strategically to allow learners to choose their workspaces. Again, to spark children's interest and exploration, thematic learning centres can be designed to emulate the Reggio Emilia approach by creating diverse learning centres that encourage exploration and independence. For instance, dedicated areas for art, reading, math, and science can be established, each equipped with age-appropriate materials and resources, promoting independent exploration.

Furthermore, using high-quality, open-ended materials like wooden toys, textiles, and tactile surfaces can engage children's senses and encourage exploration (Papadakis et al., 2020; Yavuz and Güzel, 2020). Different textures in the environment can stimulate children's tactile experiences, supporting their sensory development. Also, involving learners in decisions about how certain corners of the indoor space are arranged can help them feel a deeper connection to their classroom environment, whether it involves choosing furniture, decorations, or learning materials for specific areas (Papadakis et

al., 2018, 2016; Papadakis et al., 2020). Maria Montessori also stressed the importance of using natural materials in the classroom (Edwards, 2002). In practice, this means incorporating wooden puzzles, building blocks, and real-life objects like seashells and plants to encourage sensory exploration. Creating sensory corners with materials like sand, water, or sensory bins can engage children's tactile senses, fostering a rich, multi-sensory learning experience.

Moreover, a comprehensive understanding of ventilation, lighting, acoustic, and other environmental factors is vital for creating optimal learning environments for young children. Incorporating these considerations into both regulatory guidance and teacher training will significantly contribute to the overall well-being and developmental outcomes of learners in early childhood education settings.

Also, establishing sanitation standards, implementing a national policy for decent toilet facilities, and implementing a strong monitoring system would be of significant importance to learners (Adjibolosoo et al., 2019). Teachers are also urged to educate students on proper toilet use. Again, continuous governmental support, led by the Ministry of Education, to ensure year-round provision of handwashing facilities and materials, alongside ongoing education and awareness initiatives to enhance handwashing habits among learners should be properly implemented (Amankwah Kuffour et al., 2023). However, these studies overlook contextual realities in developing regions like Ghana, where infrastructural and policy challenges differ. This highlights the need for locally grounded research in the Ho Municipality to ensure global insights are effectively applied to improve ECE environments.

2.8 Summary of Literature Review

The literature review underscores the critical role of various factors in shaping the quality of early childhood education (ECE) environments. Scholars consistently emphasise the interconnectedness of physical space, teacher strategies, and activity-based learning in influencing learners' academic success. Early childhood, being a formative period, is deemed crucial for intellectual, social, and moral growth. Therefore, quality physical environments are identified as key contributors to positive outcomes in educational settings.

Spatial quality, encompassing elements like colour, lighting, ventilation, and materials, is highlighted as a significant determinant of the overall quality of the educational experience. The design and layout of preschool environments are recognised to profoundly impact learning, behaviour, and creativity. Learning centres within classrooms are emphasised as vital components for fostering both individual and group learning experiences. The global context reveals that Indoor Environmental Quality (IEQ) factors in ECE centres often fall below regulated standards, presenting challenges to optimal learning conditions. In Ghana, despite governmental efforts to improve education through initiatives like the capitation grant, challenges persist, particularly in impoverished urban communities. Issues such as overcrowded classrooms, structural decay, and inadequate resources pose threats to the quality of education.

The quality of school facilities, including buildings, water, sanitation, and essential materials, is deemed pivotal for effective teaching and student success. Teaching and Learning Materials (TLMs) are identified as critical contributors to Quality Early Childhood Education (QECE), with hands-on experiences and learner engagement playing key roles. However, challenges in resource availability and accessibility persist

in some contexts, potentially compromising the quality of ECE provision. Lastly, hygiene practices, specifically handwashing, emerge as a significant concern in some municipalities. Deficiencies in handwashing knowledge and practices in basic schools highlight the need for improved facilities and educational initiatives. Efforts to address these issues, especially in the context of the COVID-19 pandemic, involve governmental and private Organisations supplying handwashing facilities to schools.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This crucial chapter typically focuses on the research methodology. The chosen research methodology should align with the research objectives, ensuring the study's credibility and reliability. This chapter guides the reader through the process of how data will be gathered, analysed, and interpreted. According to Creswell (2014), the methodology section is critical for establishing the study's rigour and validity, providing transparency about the research process. The methods chosen should be justified based on their relevance of the research questions and the broader aims of the study (Neuman, 2014).

3.1 Philosophical Paradigm

The positivism paradigm, rooted in the philosophy of positivism, holds a belief in the existence of an objective reality that can be studied and understood through empirical observation and systematic inquiry (Creswell & Creswell, 2018). Positivism paradigm was adopted because it emphasises objectivity, empirical evidence, and systematic observation. By adopting positivist approach, the researcher could gather data, analyse it objectively, and draw valid conclusions about the quality of early physical learning environments in private and public settings. Creswell (2014) explained that positivism emphasises the use of empirical evidence to study social phenomena which promotes systematic observation, measurement, and the verification of hypotheses through rigorous research methods. Also, Johnson and Onwuegbuzie (2004) suggested that positivism aligns well with correlational research designs, which aim to examine the relationships between variables.

3.2 Research Approach

Research approach refers to the overarching strategy or plan that guides the study's design, data collection, and analysis. It serves as the roadmap to achieve the research objectives. There are various research approaches, including quantitative, qualitative, and mixed methods. Quantitative research involves the collection and analysis of numerical data to identify patterns and relationships, while qualitative research focuses on understanding social phenomena through in-depth exploration of context and meaning. Mixed methods research combines both approaches for a comprehensive understanding. The choice of research approach depends on the research questions and objectives (Creswell & Creswell, 2018).

This study employed quantitative approach due to its ability to provide statistical analysis, numerical data, and objective findings. By employing quantitative method, the researcher could systematically gather data on the quality of the physical learning environment, measure variables, analyse relationships, and draw statistically valid conclusions. Creswell (2014) highlighted the strengths of the quantitative method, emphasising its ability to provide precise measurements and numerical data. Also, Johnson and Onwuegbuzie (2004) argued that quantitative method is well-suited for studies aiming to quantify and measure variables. This would enable the researcher to test hypotheses, make predictions, and draw objective conclusions based on empirical evidence. Therefore, by adopting this method, the researcher could ensure a systematic and reliable investigation of the research topic and objectives.

3.3 Research Design

Research design is the blueprint that outlines the overall strategy and structure of a research study, guiding the collection and analysis of data to address the research

questions or hypotheses. It encompasses decisions about the study's approach, data collection methods, and the overall framework for conclusions. The design is crucial in ensuring the study's validity and reliability. As Creswell (2014) suggested, the choice of research design depends on the nature of the research objectives and the desired depth of understanding, emphasising the need for alignment between the research problem and the selected design to yield meaningful and credible results.

Correlational survey design was the most suitable for this study as it allowed for the examination of relationships between variables without manipulating or intervening in the natural settings. This design involves the systematic collection of data on two or more variables to examine whether changes in one variable are associated with changes in another. Correlational studies do not imply causation but rather illuminate patterns of association. Researchers employing this design aim to uncover the degree and direction of relationships, providing valuable insights into the interconnectedness of variables within a given context. By employing this design, the researcher can investigate the associations between the public and private settings and the various outcomes. Fraenkel and Wallen (2019) explained that the correlational survey design is suitable when a researcher aims to explore the relationships between variables and determine the degree to which they co-vary.

3.4 Study Area

The study was conducted in Ho Municipality, which serves as the capital of the Volta Region in Ghana. Located in the south-eastern part of the country, Ho Municipality is geographically positioned between latitudes 6°20’N and 7°15’N and longitudes 0°15’E and 0°53’E.

Figure 2: Map of Ho Municipality

Source: Ghana Statistical Service, 2014

This area is strategically significant as it serves as a central hub for both administrative and educational activities in the Volta Region. Ho Municipality is characterised by a diverse topography, consisting of gentle hills, valleys, and plains, contributing to a varied landscape. The area experiences a tropical savannah climate, with two main rainy seasons occurring from March to July and September to November, and a relatively dry season from December to February. This climatic condition is conducive for agricultural activities, which is a primary occupation of the inhabitants, alongside trading and small-scale industrial activities.

The municipality has a diverse population, comprising various ethnic groups with the Ewe being the predominant ethnic group. According to the Ghana Statistical Service (2021), Ho Municipality has an estimated population of approximately 180,000 people, with a fairly even distribution between urban and rural areas. The urban areas, particularly Ho town, are more developed and serve as the administrative and educational centre of the municipality.

Ho Municipality is renowned for its educational institutions, ranging from basic schools to tertiary institutions. The focus of this study was on Early Childhood Education (ECE) centres, both public and private, spread across the municipality. The educational facilities in the municipality are relatively well-distributed, with a concentration of schools in the urban areas. However, there are significant differences in the quality of physical learning environments between public and private ECE centres, which forms the basis of this research.

The choice of Ho Municipality as the study area is significant due to its status as an educational hub in the Volta Region. The municipality is home to a variety of ECE centres, making it an ideal location for comparing the physical learning environments between public and private institutions. Moreover, the municipality's diverse demographic and geographic characteristics provide a comprehensive context for assessing the factors influencing the quality of educational facilities.

Ho Municipality is relatively accessible by road, with a network of major roads connecting it to other parts of the Volta Region and the country at large. The proximity to Togo’s border also enhances its strategic importance. Public transportation is available, making it easier for data collection across various ECE centres within the municipality.

3.5 Population of the Study

The choice of the population for the researcher's study is critical in ensuring that the research findings are applicable and relevant to the context being investigated. The population targeted for the study comprised all kindergarten teachers from public and registered private Early Childhood Education (ECE) centres in Ho Municipality. This selection was grounded in the assumption that these teachers possess valuable insights and experiences regarding the physical environment in early childhood education. By incorporating both types of centres, the study sought to offer an in-depth insight into the quality of the physical environment in early childhood education specifically within Ho Municipality. Data from the Ho Municipal Education Directorate as at May 2024 indicated that, there were 284 kindergarten teachers in the 95 public kindergartens schools. Also, the registered private kindergarten schools were 52 with 100 teachers.

3.6 Sample Size

In this study, a comprehensive and systematic approach was undertaken to determine an appropriate sample size that would be representative of the population of kindergarten teachers for public and registered private kindergartens in the Ho Municipality. 100 public kindergarten teachers were sampled out of 284 to represent the entire population. Given the limited availability of private kindergarten teachers, the researcher included all 100 kindergarten teachers from the registered private schools. This approach is essential in comparative studies to minimize sampling bias, which can occur if one group is disproportionately represented. By maintaining equal sample sizes, the researcher aimed to provide a balanced comparison and enhance the generalisability of the results. Equal sample sizes help control for potential confounding variables and ensure that any observed differences between groups are more likely

attributable to the variables under study rather than to discrepancies in sample size (Maxwell, 2013; Creswell, 2014). In all, the sample size for the study was 200.

3.7 Sampling Techniques

For the public ECE centres, the researcher employed simple random sampling technique, specifically the lottery method, to select a representative sample due to the large population size. Based on statistics from the Ho Municipal Education Directorate as of May 2024, there were 95 public kindergartens with a total of 284 teachers kindergarten 1 and 2 teachers. To select the sample from the public schools, a simple random sampling technique using the lottery method was employed. Each of the 284 KG1 and KG2 teachers was assigned a unique identification number. These numbers were written on small pieces of paper, folded, and placed in a container. The slips were thoroughly mixed to ensure randomness, after which 100 slips were blindly drawn, one at a time, without replacement. The teachers corresponding to the selected numbers constituted the sample for the public schools. This procedure ensured that every teacher had an equal and fair chance of being included in the study (Creswell & Creswell, 2018; Fraenkel et al., 2019). Regarding the sampling technique for private ECE centres, the researcher employed a census sampling technique. According to information obtained from the Private School Coordinator at the Ho Municipal Education Directorate, there are currently 52 registered private schools. Among these, 48 schools have separate teachers for Kindergarten 1 (K.G.1) and Kindergarten 2 (K.G.2), totalling 96 teachers. In the remaining four schools, K.G.1 and K.G.2 were merged, resulting in one teacher handling both classes. Consequently, the total number of teachers in the registered private schools in the municipal is 100. Given the manageable number, the researcher opted to include all teachers from these private schools in the sample. Census sampling is a suitable method when the population size is relatively small, ensuring

comprehensive data collection and representation of the entire population (Bryman, 2016; Creswell, 2014).

3.8 Data Collection Instrument

A self-designed questionnaire was used to collect data for the study. A 5-point Likert Scale questionnaire was employed as the data collection instrument. Likert scale questionnaire is a widely acknowledged and extensively employed research instrument renowned for its efficacy in gauging attitudes and perceptions (Likert, 1932). The researcher selected the questionnaire as a data collection tool because the respondents, who were kindergarten teachers, were literate and capable of reading and answering the items independently.

The questionnaire was divided into five sections (A-E). section A contained six items (1-6) aimed at gathering demographic information about respondents. Section B included fourteen items (7-20) that explored kindergarten teachers' perception on the indoor space (seating arrangements and learning centres) of public and private Early Childhood Education (ECE) centres. Section C had thirteen (13) items (21-33), which examined the spatial quality (noise level, ventilation, lighting, and room design (teaching and learning resources and colour) of public and private ECE centres. Section D consisted of six (6) items (i.e. items 34-39) which explored the facilities (hand-washing and washroom facilities) of public and private ECE centres. Section E comprised of eleven (11) items (i.e. items 40-50) which considered the strategies that could be adopted to enhance the quality of physical learning environments. To make it easier for the respondents to complete, the questionnaire used a five-point Likert scale with the following options: Strongly Agree (SA) = 5, Agree (A) =4, Neutral (N) =3, Disagree (D) =2 and Strongly Disagree (SD) =1 respectively. Respondents were asked

to indicate their level of agreement or disagreement with each statement, allowing for nuanced and graded insights into their attitudes or opinions.

3.9 Pilot Testing

Pilot testing is a crucial phase in the research process, serving as a preliminary evaluation of research instruments or methodologies before their full-scale implementation. The data collection instrument (Likert Scale Questionnaire) was pre-tested in a location that shares similar characteristics to the study area. In alignment with this, the questionnaire was pilot tested in 10 selected public and registered private kindergarten schools within the Winneba Township. These included: Public Basic Schools; University Practice School North and South Campus, Don Bosco Catholic School, Effutu Municipal Assembly KG, Primary, & JSS and Ansaful Government School; Private Basic Schools; Ebenezer Memorial Preparatory, H and E Preparatory School, Uncle Rich Preparatory, St. Paul Methodist Preparatory School, and Family Care School. These schools were selected due to their resemblance in characteristics with respect to the quality physical learning environment to the actual schools within the Ho Municipality, thereby making them suitable for pilot testing.

This iterative step allowed the researcher to identify and rectify potential issues in data collection tool, ensuring their reliability and validity (Denscombe, 2014; Creswell & Creswell, 2017). The pilot testing also uncovered ambiguities or confusing elements in the instrument, allowing for refinements to enhance clarity (Teddlie & Tashakkori, 2009).

3.10 Validity and Reliability of Instrument

3.10.1 Validity

Validity refers to the extent to which a measure truly reflects the idea under study. The questionnaire was subjected to face and content validity. Face validity refers to the process of verifying if the items on an instrument measure what they purport to (Kuranchie, 2021). The questionnaire was presented to my peers to verify whether the items appear valid to achieve the objectives of the study. While the content validity entails checking to see if the items on an instrument are enough to cover the objectives of the study. Expert judgment is used to check the adequacy of the items (Ary et al, 2010). Thus, the instrument was given to my supervisor and other experts in the subject area or topic to assist assess its content validity.

3.10.2 Reliability

Reliability refers to the extent to which a research instrument produces consistent or stable results over time. For an instrument to be deemed reliable, it should provide similar outcomes when administered multiple times to different samples randomly selected from the same population (Mugenda & MUgenda, 1999). Following this principle, Cronbach Alpha was utilised in measuring the internal consistency of the questionnaire.

This statistical measure quantifies the extent to which items in the questionnaire consistently measure the same construct, with higher values indicating greater reliability (Tavakol & Dennick, 2011). In the present study, internal consistency reliability was assessed for each research question. The Cronbach alpha for Research Question 1 (RQ1) was 0.956; for Research Question 2 (RQ2), it was 0.974, Research Question 3 (RQ3) recorded a value of 0.719; and Research Question 4 (RQ4) yielded

an alpha of 0.913. An overall Cronbach alpha of 0.980 was obtained. This implies that all the items on the instrument were reliable for the data collection. According to Tavakol and Dennick (2011), a Cronbach's alpha above 0.90 indicates excellent reliability and .070 indicates acceptable threshold, suggesting that the questionnaire items were consistent in measuring the intended constructs.

3.11 Data Collection Procedure

The initial step in the data collection process involved obtaining an introductory letter from my Department, which was a crucial component in informing respondents about the study's purpose, objectives, and procedures. The introductory letters served as a foundational element in establishing a transparent and ethical connection between the researcher and the respondents, ensuring that individuals were fully apprised of the study's context and comprehended the extent of their involvement in the research (Smith, 2018; Creswell & Creswell, 2018).

Following the dissemination of the introductory letter, the next phase involved the personal administration of the questionnaire. This in-person approach was deliberately chosen to facilitate face-to-face interaction between the researcher and the respondents. This strategy cultivated a deeper understanding of the questionnaire among the respondents, potentially enhancing their motivation to engage actively in the survey process. Moreover, the personal administration of the questionnaire provided a valuable opportunity for the researcher to address any queries or concerns that the respondents had regarding the content or purpose of the questionnaire. This interactive process ensured clarity and accuracy in the respondents' responses, contributing to the overall reliability of the collected data. Additionally, this hands-on approach enabled the researcher to oversee and meticulously control the data collection process, thereby

ensuring strict adherence to the study's intended protocol and ethical guidelines (Bryman, 2016; Neuman, 2014). The data collection, which took place in the Ho Municipality, lasted for three (3) months.

3.12 Data Analysis

Descriptive statistics (means, standard deviations, and percentages) were used to summarise and describe the characteristics of the dataset, providing a clear overview of the distribution of responses on the Likert scale. Descriptive measures like the mean give insights into the central tendency of the data, while standard deviations indicate the spread or variability within the dataset. These statistics are crucial in understanding patterns and trends before moving on to inferential analysis (Field, 2013). Additionally, inferential statistics, specifically, independent samples t-test, were employed to determine whether there were statistically significant differences between the two dependent groups (public and private ECE centres). The independent samples t-test compares the means of two groups to establish if the observed differences are likely due to chance or represent a real difference in the population (Pallant, 2020).

3.13 Ethical Considerations

Ethical considerations constitute a fundamental aspect of any research endeavour, ensuring the protection and well-being of respondents. In adherence to ethical guidelines, the research study prioritised informed consent as a cornerstone principle. Respondents were briefed on the aim of the study, the procedures involved, potential benefits, and their rights throughout the research process. This transparent communication empowered them to make voluntary and well-informed decisions about their participation, ensuring that no coercion or misinformation influences their consent (Smith, 2018).

Furthermore, confidentiality was rigorously upheld throughout the research process. The information and data shared by the respondents were treated with the utmost sensitivity, safeguarding their privacy and preventing unauthorized access. This commitment is paramount for establishing a foundation of trust between the researcher and the respondents, fostering an environment where they feel secure in expressing their thoughts and experiences. The assurance of confidentiality not only aligns with ethical standards but also serves to mitigate potential harm, such as breaches of privacy or discrimination (American Psychological Association [APA], 2017).

In addition, the principle of anonymity was observed to further protect participants' identities. The questionnaires did not require respondents to provide names or any identifiable information, ensuring that responses could not be traced back to individual participants. This approach enhanced participants' sense of security and encouraged honest and unbiased responses.

The researcher also ensured that conflicts of interest were avoided throughout the study. There were no personal, financial, or professional interests that could have influenced the research process or the interpretation of results. This neutrality strengthened the objectivity and credibility of the findings.

Lastly, the principle of justice was maintained by ensuring fairness and equity in the selection and treatment of all participants. Every respondent was given an equal opportunity to participate, and no group was favoured or disadvantaged at any stage of the research. This commitment upheld the ethical responsibility of treating all participants with dignity and respect.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.0 Overview

This chapter presents the data collected from the study and offers a detailed analysis and discussion of the findings. The chapter is organised to first introduce the demographic characteristics of the respondents, which sets the context for the subsequent analysis. The primary focus is on the application of the independent samples t-test to examine differences between groups.

The analysis begins with an overview of the descriptive statistics, providing insights into the central tendencies and variability of the data collected. Following this, independent samples t-tests were conducted to examine whether statistically significant differences exist in the perceptions of key variables between public and private Early Childhood Education (ECE) centres in the Ho Municipality. Descriptive statistics and t-test results are then analysed in relation to the research questions and hypotheses, providing insights into the significance of the observed differences. The chapter concludes with discussions grounded in existing literature, comparing the findings with prior research.

4.1 Demographic Description of Respondents

Understanding the demographic characteristics of the respondents is crucial in contextualising the findings of this study. These characteristics provide insights into the background of the respondents, which can influence their perceptions and responses. In this section, the demographic data collected from the respondents, including variables such as age range, gender, area of specialisation, number of years in service as a Kindergarten teacher, and highest professional qualification, are presented and

analysed. The demographic analysis serves as a foundation for interpreting the subsequent statistical findings, ensuring that the conclusions drawn are grounded in the realities of the respondent population.

Table 4.1 presents the gender distribution of the respondents who participated in the study.

Table 4. 1: Gender of the Respondents

Variable	Frequency	Percentage
Male	2	1.0
Female	198	99.0
Total	**200**	**100.0**

Source: Field Data (2024).

A total of 200 respondents were surveyed, and the data reveal a significant gender disparity among the respondents. It is evident that the overwhelming majority of the respondents were females, accounting for 99.0% (n=198) of the total sample size. In contrast, male respondents comprised only 1.0% (n=2) of the sample. This significant gender disparity suggests that the field in question (early childhood education) is predominantly female-dominated, which aligns with existing literature that often highlights the higher representation of females in this profession.

The data presented in Table 4.2 reveal a diverse age distribution among the respondents.

Table 4. 2: Age Range of Respondents

Variable	Frequency	Percentage
18-20 years	9	4.5
21-30 years	64	32.0
31-40 years	52	26.0
41-50 years	45	22.5
51-60 years	29	14.5
61and above years	1	0.5
Total	**200**	**100.0**

Source: Field Data (2024).

The most represented age group is 21-30 years, comprising 32.0% (n=64) of the total sample. This is followed by the 31-40 years age group, which constitutes 26.0% (n=52) of the respondents. Together, these two age groups account for more than half of the sample, indicating that a significant proportion of the respondents are in the early to mid-career stage. The 41-50 years age group also represents a substantial portion of the respondents, with 22.5% (n=45) of the total. This suggests that a considerable number of the respondents are in their later career stages, likely bringing a wealth of experience to the study.

The 51-60 years age group constitutes 14.5% (n=29) of the respondents, while the 18-20 years age group accounts for 4.5% (n=9). These figures indicate that while there is some representation from both younger and older age brackets, the majority of the respondents are clustered between 21 and 50 years. The smallest age group is 61 and above years, with only 0.5% (n=1) of the respondents falling into this category. This minimal representation of older respondents suggests that the profession have fewer individuals working beyond the typical retirement age, or it may reflect a trend where older individuals transition out of this profession.

The data in Table 4.3 reveal a diverse range of educational qualifications among the respondents, indicating a varied level of academic achievement within the sample of kindergarten teachers.

Table 4. 3: Academic Qualification

Variable	Frequency	Percentage (%)
WASSCE	54	27.0
Diploma	64	32.0
Bachelor's Degree	81	40.5
Masters	1	0.5
Total	**200**	**100.0**

Source: Field Data (2024).

The largest proportion of the respondents, 40.5% (n=81), possess a degree. This indicates that a significant number of the teachers have attained higher education, which aligns with the increasing emphasis on the need for more qualified educators in the field of early childhood education. The high percentage of degree holders suggests that many of the respondents have undergone comprehensive training, which may positively influence the quality of education provided. The second most common qualification is a diploma, held by 32.0% (n=64) of the respondents. Diploma programs typically offer focused training in early childhood education, equipping teachers with the necessary skills and knowledge to effectively manage kindergarten classrooms. A notable 27.0% (n=54) of the respondents possess only a WASSCE qualification. This suggests that over a quarter of the teachers in the study have not pursued formal teacher training beyond secondary education. While they may bring valuable experience to their roles, the absence of specialised training could impact their ability to implement modern pedagogical techniques. Only 0.5% (n=1) of the respondents has attained a master's degree. This low percentage indicates that advanced education in this field is relatively rare among the respondents, which might reflect broader trends in the profession where fewer teachers pursue graduate studies.

The data in Table 4.4 show that the respondents come from a wide range of academic specialisations, reflecting the diverse educational backgrounds present in the teaching profession.

Table 4. 4: Area of Specialisation (programme offered at school)

Variable	Frequency	Percentage
Early Childhood Education	45	22.5
Basic Education	53	26.5
English Language	11	5.5
Special Education	4	2.0
General Arts	44	22.0
General Science	31	15.5
Visual Arts	3	1.5
Home Economics	6	3.0
Nursing	2	1.0
Business	1	0.5
Total	**200**	**100.0**

Source: Field Data (2024).

The largest group of the respondents specialised in Basic Education, comprising 26.5% (n=53) of the sample. This is followed closely by those with a specialisation in Early Childhood Education, representing 22.5% (n=45). A sizable number of the respondents (22.0%, n=44) have a background in General Arts, while General Science accounts for 15.5% (n=31). Although these fields are not directly related to early childhood education, it indicates the diversity of academic backgrounds of teachers working at the kindergarten level. Some of the respondents have specialised in English Language (5.5%, n=11) and Special Education (2.0%, n=4), which are crucial areas for teaching and inclusive education. The presence of teachers with special education training is particularly significant in promoting inclusive learning environments for children with disabilities or special needs. Teachers with backgrounds in Visual Arts (1.5%, n=3),

Home Economics (3.0%, n=6), Nursing (1.0%, n=2), and Business (0.5%, n=1) form a smaller percentage of the sample.

4.2 Analysis of data from the Research Questions

This section displays the data collected from the field, aimed at addressing the research objectives. The analysis is structured around the study's specific research questions.

Research Question One: What is the quality of indoor space of public and private Early Childhood Education (ECE) centres in Ho Municipality?

By examining elements such as physical layout, furniture arrangement, and availability of learning centres, this study sought to identify how these factors influence the quality of educational experiences provided to young learners. Data collected in answer to this research question has been presented in Table 4.5

Table 4.5 presents findings on the indoor space of public and private Early Childhood Education (ECE) centres. The data compares several aspects of classroom furniture and layout using a Likert scale, where the responses are categorised as Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). Mean values and standard deviations (SD) are also reported for each variable.

Table 4. 5: Quality of indoor space of public and private ECE centres **(N=200)**

Variable	Type of ECE Centre	SD %	D %	N %	A %	SA %	Mean	SD
The classroom furniture is well organised and free from clutter.	Public	5 (5%)	25(25%)	0 (0%)	34 (34%)	36 (36%)	3.68	1.33
	Private	25(25%)	40(40%)	0 (0%)	6 (6%)	29 (29%)	2.71	1.59
The furniture arrangement allows for easy movement around the classroom.	Public	0 (0%)	9 (9%)	0 (0%)	84 (84%)	7 (7%)	3.89	0.65
	Private	5 (5%)	58(58%)	0 (0%)	37 (37%)	0 (0%)	2.67	1.03
The classroom setup supports different learning activities and group interactions.	Public	0 (0%)	24(24%)	1 (1%)	64 (64%)	11 (11%)	3.62	0.97
	Private	27(27%)	29(29%)	0 (0%)	44 (44%)	0 (0%)	2.55	1.29
The learner's feet rest comfortably on the floor when they are seated on the chair.	Public	0 (0%)	2 (2%)	0 (0%)	82 (82%)	16 (16%)	4.12	0.48
	Private	0 (0%)	2 (2%)	0 (0%)	91 (91%)	7 (7%)	4.03	0.39
The learners lean against a supportive surface to relax their backs.	Public	0 (0%)	0 (0%)	0 (0%)	88 (88%)	12 (12%)	4.12	0.33
	Private	0 (0%)	2 (2%)	0 (0%)	94 (94%)	4 (4%)	4.00	0.35
There is a table available for learners to place their books on,	Public	0 (0%)	2 (2%)	1 (1%)	84 (84%)	13 (13%)	4.08	0.46
	Private	0 (0%)	2 (2%)	0 (0%)	86 (86%)	12 (12%)	4.08	0.44

write, and comfortably rest their arms while writing.								
The edges of the furniture are designed to prevent injury to the learners.	Public	0 (0%)	4 (4%)	3 (3%)	76 (76%)	17 (17%)	4.06	0.60
	Private	17(17%)	32(32%)	1 (1%)	50 (50%)	0 (0%)	2.81	1.23
There are learning centres in my classroom.	Public	0 (0%)	17(17%)	1 (1%)	69 (69%)	13 (13%)	3.78	0.88
	Private	38(38%)	36(36%)	2 (2%)	24 (24%)	0 (0%)	2.07	1.14
The physical layout of the classroom supports effective use of learning centres.	Public	0 (0%)	25(25%)	4 (4%)	61 (61%)	10 (10%)	3.56	0.98
	Private	8 (8%)	52(52%)	2 (2%)	38 (38%)	0 (0%)	2.64	1.05
The learning centres cover a range of subjects, including math, literacy, science, and art.	Public	0 (0%)	0 (0%)	6 (6%)	50 (50%)	44 (44%)	4.38	0.59
	Private	0 (0%)	0 (0%)	66(66%)	25 (25%)	9 (9%)	3.42	0.65
Each learning centre is clearly labeled and easy for learners to identify.	Public	0 (0%)	0 (0%)	38(38%)	57 (57%)	5 (5%)	3.67	0.57
	Private	0 (0%)	6 (6%)	52(52%)	42 (42%)	0 (0%)	3.24	0.55
Learners are engaged and actively participate in activities at the learning centres.	Public	0 (0%)	0 (0%)	40(40%)	54 (54%)	6 (6%)	3.66	0.59
	Private	0 (0%)	0 (0%)	51(51%)	49 (49%)	0 (0%)	3.45	0.50
The learning centres encourage independent exploration and discovery.	Public	0 (0%)	1 (1%)	2 (2%)	52 (52%)	45 (45%)	4.39	0.58
	Private	0 (0%)	0 (0%)	54(54%)	46 (46%)	0 (0%)	3.45	0.50
The materials at the learning centres are safe and free from hazards.	Public	0 (0%)	0 (0%)	8 (8%)	54 (54%)	38 (38%)	4.30	0.61
	Private	0 (0%)	0 (0%)	46(46%)	54 (54%)	0 (0%)	3.51	0.50

Source: Field Data (2024).

The data in Table 4.5 show that, in public ECE centres, 34 (34%) of the respondents agreed, and 36 (36%) strongly agreed that the classroom furniture is well organised and free from clutter, resulting in a relatively high mean score of 3.68 (SD = 1.33). This indicates that public ECE centres are generally perceived positively in terms of furniture organisation. In contrast, private ECE centres demonstrated a less favourable response, with 40 (40%) of the respondents disagreeing and 29 (29%) strongly agreeing, leading to a much lower mean of 2.71 (SD = 1.59). The wider distribution of responses and higher standard deviation suggest varied opinions, highlighting a significant perception of disorganisation in private centres. Thus, the comparison clearly shows that public ECE centres are better organised and have less clutter compared to their private counterparts, as evidenced by the higher mean score and more positive response distribution. The disparity observed in private centres may point to inconsistencies in furniture arrangement practices across different schools.

Further emphasising the differences in space management, 84 (84%) of the respondents in public ECE centres agreed that the furniture arrangement allows for easy movement around the classroom, resulting in a mean score of 3.89 (SD = 0.65). This strong consensus reflects positive perceptions regarding space management in public centres. Conversely, in private ECE centres, 58 (58%) of the respondents disagreed, while only 37 (37%) agreed, leading to a lower mean score of 2.67 (SD = 1.03). The higher standard deviation in private centres indicates a more diverse set of opinions among respondents, underscoring a notable gap in the effectiveness of furniture arrangement for facilitating movement. This indicate that while public centres generally provides the support for free movement, private centres face notable challenges in arranging furniture to facilitate mobility.

Regarding the classroom setup supports different learning activities and group interactions, 64 (64%) of the respondents in public ECE centres agreed, and 11 (11%) strongly agreed, yielding a mean score of 3.62 (SD = 0.97). This reflects a generally positive view of how public ECE centres arrange their space to accommodate diverse learning needs. In contrast, private centres exhibited a much lower mean score of 2.55 (SD = 1.29), with 27 (27%) of the respondents strongly disagreeing and 29 (29%) disagreeing. This shows that while public centres are generally seen as accommodating varied learning needs, private centres are perceived as less supportive in this regard.

Examining seating arrangements, an overwhelming majority of the respondents, 82 (82%) in public ECE centres agreed, and 16 (16%) strongly agreed, reported that learners' feet rest comfortably on the floor when they are seated, resulting in a high mean score of 4.12 (SD = 0.48). Similarly, private centres achieved a mean score of 4.03 (SD = 0.39), with 91% of respondents agreeing. This demonstrates that both types of centres perform well in providing ergonomic seating arrangements, indicating no significant difference between them.

Furthermore, 88 (88%) of the respondents in public ECE centres agreed and 12 (12%) strongly agreed that learners lean against a supportive surface to relax their back, yielding a high mean score of 4.12 (SD = 0.33). In private ECE centres, the results showed 94 (94%) agreement and 4 (4%) strong agreement, leading to a mean score of 4.00 (SD = 0.35). This similarity suggests that both centre types effectively provide supportive seating for learners, with only a marginal difference in satisfaction levels.

In terms of tables available for learners to place their books on and comfortably rest their arms while writing, the data shows that public ECE centres received a mean score of 4.08 (SD = 0.47) based on 84 (84%) of the respondents agreeing and 13 (13%)

strongly agreeing that tables allow learners to place their books and comfortably rest their arms while writing. Private centres mirrored this performance with an identical mean score of 4.08 (SD = 0.44), indicating that both centre types are equally effective in providing adequate tables for learners.

Again, safety considerations are paramount in classroom design. In public ECE centres, 76 (76%) of the respondents agreed, and 17 (17%) strongly agreed that furniture edges are designed to prevent injury, leading to a mean score of 4.06 (SD = 0.60). However, private centres reported a lower mean score of 2.81 (SD = 1.23), with 50 (50%) agreeing, 32 (32%) disagreeing, and 17 (17%) strongly disagreeing. This indicates that while public centres generally ensure child safety through furniture design, private centres show significant gaps that need attention.

The presence of learning centres within classrooms is another critical aspect. In public ECE centres, 69 (69%) of the respondents agreed and 13 (13%) strongly agreed that learning centres exist, resulting in a mean score of 3.78 (SD = 0.88). Conversely, in private centres, a significant 38 (38%) of the respondents strongly disagreed to the existence of such centres, and 36 (36%) disagreed, yielding a much lower mean score of 2.07 (SD = 1.14). This substantial difference underscores that public centres are more likely to establish designated learning areas within their classrooms compared to private centres, indicating a potential gap in the latter's provision of specific learning environments.

The physical layout of the classroom also plays a crucial role in the effectiveness of learning centres. Public ECE centres scored a mean of 3.56 (SD = 0.98), with 61 (61%) of the respondents agreeing that the physical layout of the classroom supports effective use of learning centres. In contrast, private centres fared worse, with only 38 (38%)

agreeing and 52 (52%) disagreeing, resulting in a lower mean score of 2.64 (SD = 1.05). This indicates that public centres have more conducive layouts for varied learning activities, suggesting a need for private centres to reassess their classroom designs.

When examining the range of subjects covered by learning centres, public ECE centres significantly outperformed private centres. With a mean score of 4.38 (SD = 0.59), 50 (50%) of the respondents agreed and 44 (44%) strongly agreed that their learning centres cover a broad range of subjects, including mathematics, literacy, science, and art. In contrast, private centres had a lower mean score of 3.42 (SD = 0.65), with 66 (66%) of the respondents remaining neutral on this issue. This disparity implies that public centres provide a more diverse array of learning opportunities, potentially impacting the breadth of learning experiences available to children in private centres.

Labelling and identifying learning centres is another area where public centres excelled. In public centres, 57 (57%) of the respondents agreed and 5 (5%) strongly agreed that learning centres are clearly labelled and easy for learners to identify, resulting in a mean score of 3.67 (SD = 0.57). In comparison, private centres showed less clarity, with 52 (52%) of the respondents remaining neutral and only 42 (42%) agreeing, leading to a lower mean score of 3.24 (SD = 0.55). This suggests that public centres are more effective in ensuring that learners can easily navigate and identify their activities, while the higher percentage of neutral responses in private centres indicates inconsistencies in labelling practices, which may affect learner engagement.

Engagement and active participation of learners at the learning centres are crucial for enhancing the learning experience. In public ECE centres, 54 (54%) of the respondents agreed, and 6 (6%) strongly agreed that learners actively participate in activities at the learning centres, yielding a mean score of 3.66 (SD = 0.59). In contrast, private centres

reported a slightly lower mean score of 3.45 (SD = 0.50), with 51 (51%) of the respondents remaining neutral and 49 (49%) agreeing. This suggests that while both centre types promote participation, public centres are perceived as more effective, possibly due to better organised and diverse learning centres.

The encouragement of independent exploration and discovery at the learning centres is another essential function of learning centres. Public ECE centres showed a strong emphasis on fostering learner autonomy, with 52 (52%) of the respondents agreeing and 45 (45%) strongly agreeing that the learning centres encourage independent exploration, resulting in a high mean score of 4.39 (SD = 0.58). Conversely, private centres received a lower mean score of 3.45 (SD = 0.50), with 54 (54%) agreeing and 46 (46%) remaining neutral. This comparison highlights a notable difference, indicating that public centres offer more opportunities for independent learning and discovery, which are vital components of effective early childhood education.

Lastly, the safety of materials used at the learning centres is crucial for ensuring a secure learning environment. In public ECE centres, 54 (54%) of the respondents agreed, and 38 (38%) strongly agreed that materials at the learning centres are safe and free from hazards, leading to a high mean score of 4.30 (SD = 0.61). In private centres, 54 (54%) agreed and 46 (46%) were neutral, resulting in a lower mean score of 3.51 (SD = 0.50). This suggests that while both centre types provide relatively safe materials, public centres are perceived to offer a higher level of safety assurance in their learning environments. The lower variability in public centre responses further reinforces the consistency in safety practices, while private centres exhibit more diverse perceptions of safety.

Research Question Two: What is the spatial quality of public and private ECE centres in the Ho Municipality?

The research question aimed to investigate and compare the various aspects of spatial quality within early childhood education (ECE) centres in the Ho Municipality. By examining factors such as ventilation, noise levels, availability of learning materials, room colour, and lighting, this study seeks to identify potential disparities between public and private ECE Centres in creating conducive learning environments.

The data in Table 4.6 reveal noticeable differences between public and private early childhood education (ECE) centres in terms of spatial quality.

Table 4. 6: Spatial quality of public and private ECE centres (ventilation, noise level, learning materials, room colour, lighting) **(N=200)**

Variable	Type of ECE Centre	SD %	D %	N %	A %	SA %	Mean	SD
Background noise from outside the classroom does not disrupt learning activities.	Public	6 (6%)	21(21%)	1 (1%)	68 (68%)	4 (4%)	3.46	1.03
	Private	2 (2%)	52 (52%)	2 (2%)	40 (40%)	4 (4%)	2.89	1.06
The classroom environment allows for clear communication with learners during lessons without raising my voice.	Public	0 (0%)	16 (16%)	1 (1%)	82 (82%)	1 (1%)	3.68	0.75
	Private	0 (0%)	44 (44%)	1 (1%)	54 (54%)	1 (1%)	3.10	1.01
The classroom setup helps in reducing noise levels.	Public	12 (12%)	15 (15%)	5 (5%)	25 (25%)	43(43%)	3.71	1.45
	Private	13 (13%)	32 (32%)	10(10%)	40 (40%)	5 (5%)	2.92	1.20
I am satisfied with the current noise level and setup in my classroom.	Public	5 (5%)	2 (2%)	10(10%)	51 (51%)	32 (32%)	4.02	0.97
	Private	6 (6%)	42 (42%)	6 (6%)	41 (41%)	5 (5%)	2.95	1.13
The classroom setup allows for adequate ventilation to ensure fresh air circulation.	Public	2 (2%)	10 (10%)	1 (1%)	75 (75%)	12 (12%)	3.95	1.06
	Private	2 (2%)	25 (25%)	1 (1%)	65 (65%)	7 (7%)	3.50	1.01
The classroom has mechanical ventilation system (fans or air conditioners) that functions well.	Public	6 (6%)	22 (22%)	0 (0%)	71 (71%)	1 (1%)	3.39	1.03
	Private	9 (9%)	18 (18%)	14(14%)	58 (58%)	1 (1%)	3.24	1.06
The air quality in the classroom is good and does not cause discomfort or health issues to learners.	Public	2 (2%)	2 (2%)	0 (0%)	75 (75%)	21 (21%)	4.11	0.68
	Private	1 (1%)	22 (22%)	0 (0%)	77 (77%)	0 (0%)	3.57	0.84
There is an artificial lighting in my classroom that enhances the learning environment.	Public	0 (0%)	13 (13%)	0 (0%)	84 (84%)	3 (3%)	3.77	0.71
	Private	12 (12%)	12 (12%)	0 (0%)	76 (76%)	0 (0%)	3.40	1.10

The walls of the classroom are painted with colours that are appropriate for the age group of my learners.	Public	2 (2%)	12 (12%)	0 (0%)	66 (66%)	20 (20%)	3.90	0.93
	Private	2 (2%)	23 (23%)	0 (0%)	66 (66%)	9 (9%)	3.57	1.01
The walls are decorated with colourful informative and age-appropriate learning aids (charts, pictures).	Public	2 (2%)	20 (20%)	2 (2%)	55 (55%)	21 (21%)	3.71	1.06
	Private	3 (3%)	48 (48%)	3 (3%)	35 (35%)	11 (11%)	3.01	1.19
The TLRs are regularly updated to reflect current educational practices for learners.	Public	2 (2%)	10 (10%)	1 (1%)	74 (74%)	13 (13%)	3.86	0.84
	Private	3 (3%)	29 (29%)	2 (2%)	62 (62%)	4 (4%)	3.35	1.04
The TLRs encourages hands-on exploration, creativity and imagination among learners.	Public	0 (0%)	2 (2%)	3 (3%)	78 (78%)	17 (17%)	4.10	0.52
	Private	1 (1%)	34 (34%)	8 (8%)	54 (54%)	3 (3%)	3.24	0.99
I am satisfied with the Teaching and Learning Resources in my classroom.	Public	4 (4%)	13 (13%)	3 (3%)	63 (63%)	17 (17%)	3.76	1.02
	Private	9 (9%)	29 (29%)	5 (5%)	53 (53%)	4 (4%)	3.14	1.16

Source: Field Data (2024).

In terms of background noise from outside the classroom does not disrupt learning activities, 68 (68%) of public ECE centres agree that external noise does not disrupt learning activities, with 4 (4%) strongly agreeing. Only 6 (6%) strongly disagree, while 21 (21%) disagreed and 1 (1%) remain neutral. Public ECE centres show a relatively higher satisfaction in this regard, with a mean of 3.46 (SD = 1.03). On the other hand, 52 (52%) of private ECE centres disagreed that external noise is not a disruption, with 40 (40%) agreeing and only 2 (2%) strongly disagreeing. The mean of 2.89 (SD = 1.06) reflects a comparatively less positive perception of noise control in private ECE centres. This indicates that public centres manage external noise more effectively than private centres, where disruptions remain a greater concern.

In relation to clear communication with learners, 82 (82%) of public ECE respondents agree that the classroom environment allows for clear communication with learners during lessons without raising my voice, with a small minority 16 (16%) disagreeing, resulting in a mean of 3.68 (SD = 0.75). Conversely, in private ECE centres, 54 (54%) agree to this statement, but a significant 44 (44%) disagreed, leading to a lower mean of 3.10 (SD = 1.01). This suggests public centres provide a more conducive environment for effective communication.

Looking at noise reduction, 43 (43%) of the respondents from public ECE centres strongly agree that the classroom setup helps reduce noise levels, while 25 (25%) agree. A small minority 12 (12%) strongly disagreed, leaving a mean of 3.71 (SD = 1.45). In private ECE centres, opinions are more varied, with 40 (40%) agreeing that noise levels are reduced by the setup, but 32 (32%) disagreed, and 13 (13%) strongly disagreed, leading to a lower mean of 2.92 (SD = 1.20). Public ECE centres thus seem to have a better noise management setup compared to private centres.

When asked about their satisfaction with the current noise level and setup in the classroom, 32 (32%) of public ECE centre respondents strongly agree, and 51 (51%) agree, leading to a mean score of 4.02 (SD = 0.97). In private centres, however, only 5 (5%) strongly agreed, while 41 (41%) agreed, and a significant 42 (42%) disagreed, with a mean of 2.95 (SD = 1.13). Once again, the public centres show greater satisfaction in managing noise levels.

In terms of ventilation, 75 (75%) of public ECE centre respondents agree that the classroom setup allows for adequate ventilation to ensure fresh air circulation, and 12 (12%) strongly agreed, giving a mean score of 3.95 (SD = 1.06). Private centres have a slightly lower percentage, with 65 (65%) agreeing and 7 (7%) strongly agreeing. However, 25 (25%) of private ECE respondents disagreed with the adequacy of ventilation, resulting in a mean score of 3.50 (SD = 1.01), indicating that ventilation is perceived to be better in public centres. In the case of mechanical ventilation, 71 (71%) of public ECE centre respondents agreed that their classrooms are equipped with functioning mechanical systems (fans or air conditioners), while 22 (22%) disagreed, leaving a mean score of 3.39 (SD = 1.03). In private centres, 58 (58%) agreed, but a higher proportion, 18 (18%), disagree, resulting in a slightly lower mean of 3.24 (SD = 1.06). Both settings indicate some room for improvement in terms of mechanical ventilation.

Regarding air quality, 75 (75%) of public ECE centre respondents agreed that the air quality in their classrooms is good and does not cause discomfort or health issues to learners, with 21 (21%) strongly agreeing. This results in a high mean score of 4.11 (SD = 0.68). In private ECE centres, 77 (77%) agreed, but 22 (22%) disagreed with the

statement, leading to a lower mean of 3.57 (SD = 0.84). Public ECE centres again demonstrate a stronger positive perception of air quality within classrooms.

In public ECE centres, 84 (84%) of the respondents agree that there is artificial lighting in the classroom that enhances the learning environment, with only 3 (3%) strongly disagreeing. This leads to a mean score of 3.77 (SD = 0.71), reflecting a positive perception of lighting. Conversely, in private centres, the situation is less favourable, with 76 (76%) agreeing that artificial lighting is effective, but 12 (12%) disagreed, resulting in a lower mean score of 3.40 (SD = 1.10). When it comes to the appropriateness of the classroom wall painted with colours for the age group of learners, public ECE centres again demonstrate strong agreement, with 66 (66%) agreeing and 20 (20%) strongly agreeing, yielding a mean score of 3.90 (SD = 0.93). In private centres, the findings are similar, with 66 (66%) agreeing, but only 9 (9%) strongly agreeing, leading to a slightly lower mean of 3.57 (SD = 1.01). This suggests that while both types of centres maintain age-appropriate wall colours, public centres show slightly higher satisfaction levels.

The decoration of classroom walls with colourful and informative learning aids is another area of interest. In public ECE centres, 55 (55%) agreed that the walls are decorated appropriately, with 21 (21%) strongly agreeing, resulting in a mean score of 3.71 (SD = 1.06). However, private centres appear to struggle in this area, as only 35 (35%) agreed with the statement, and a notable 48 (48%) are neutral. This leads to a much lower mean score of 3.01 (SD = 1.19), indicating a lack of vibrant and educational decorations in private settings. Regarding the regular updates of TLRs to reflect current educational practices for learners, public ECE centres show a strong commitment to this aspect, with 74 (74%) agreeing and 13 (13%) strongly agreeing, yielding a mean

score of 3.86 (SD = 0.84). In contrast, private centres show lower engagement, with only 62 (62%) agreeing and 4 (4%) strongly agreeing, leading to a mean of 3.35 (SD = 1.04). This disparity suggests that public centres may be more proactive than private centres in updating their resources to enhance educational experiences.

Furthermore, the TLRs in public centres are seen as encouraging hands-on exploration, creativity, and imagination among learners, with 78 (78%) agreeing and 17 (17%) strongly agreeing, resulting in a high mean score of 4.10 (SD = 0.52). Private centres, on the other hand, only see 54% agreeing, with a mean score of 3.24 (SD = 0.99). This indicates that public centres provide a more stimulating and creative environment for learners compared to their private counterparts. Finally, satisfaction with the overall TLRs in classrooms shows a marked difference. In public ECE centres, 63 (63%) of the respondents express satisfaction, with a mean score of 3.76 (SD = 1.02). In contrast, private centres demonstrate lower satisfaction levels, with only 53 (53%) agreeing and a mean score of 3.14 (SD = 1.16). This suggests that while public centres are generally viewed more favourably in terms of spatial quality, private centres may need to improve their teaching and learning resources to better support learners.

Research Question Three: To what extent do public and private ECE centres in Ho Municipality differ in terms of facilities?

The research question aimed to evaluate and compare the physical facilities available in both public and private early childhood education (ECE) centres within the specified area. By investigating various aspects such as, washroom facilities and hand-washing stations, this research sought to identify significant differences or similarities that may impact the quality of education and child development. Ultimately, the findings will provide insights into the adequacy of facilities in supporting effective learning

environments, informing policymakers, educators, and stakeholders about areas needing improvement and resource allocation to enhance educational outcomes for young learners.

Table 4. 7: Facilities of public and private ECE centres (washroom and hand-washing stations) **(N=200)**

Variable	Type of ECE Centre	SD %	D %	N %	A %	SA %	Mean	SD
The washroom facilities are cleaned multiple times a day and kept in good condition.	Public	16 (16%)	8 (8%)	0 (0%)	76 (76%)	0 (0%)	3.36	1.16
	Private	12 (12%)	15(15%)	0 (0%)	73 (73%)	0 (0%)	3.14	1.17
There are enough soap dispensers for students to wash their hands after using the washroom.	Public	0 (0%)	0 (0%)	2 (2%)	90 (90%)	8 (8%)	4.06	0.31
	Private	0 (0%)	0 (0%)	1 (1%)	85 (85%)	14 (14%)	4.13	0.37
The hand-washing sinks are easily accessible to all learners.	Public	0 (0%)	0 (0%)	1 (1%)	97 (97%)	2 (2%)	4.01	0.17
	Private	0 (0%)	0 (0%)	1 (1%)	97 (97%)	2 (2%)	4.01	0.17
There is always running water available at the hand-washing sinks.	Public	0 (0%)	0 (0%)	3 (3%)	92 (92%)	5 (5%)	4.02	0.28
	Private	0 (0%)	0 (0%)	4 (4%)	89 (89%)	7 (7%)	4.03	0.33
The washrooms have child-friendly facilities (e.g., toilet seats, accessible sinks).	Public	6 (6%)	44(44%)	1 (1%)	43 (43%)	6 (6%)	2.99	1.17
	Private	3 (3%)	54(54%)	1 (1%)	42 (42%)	0 (0%)	2.82	1.03
Washrooms are regularly stocked with essential supplies like soap and toilet paper.	Public	0 (0%)	1 (1%)	3 (3%)	86 (86%)	10 (10%)	4.05	0.41
	Private	0 (0%)	1 (1%)	2 (2%)	86 (86%)	11 (11%)	4.09	0.35

Source: Field Data (2024).

In Table 4.7, in public ECE centres, a significant 76 (76%) of the respondents agree that washroom facilities are cleaned multiple times a day and maintained in good condition, with a mean score of 3.36 (SD = 1.16). In contrast, private centres show slightly lower satisfaction, with 73 (73%) agreeing on the cleanliness and condition of the facilities, resulting in a mean score of 3.14 (SD = 1.17). This indicates that public centres are perceived to have slightly superior maintenance of washroom facilities compared to private ones. When evaluating the availability of soap dispensers for handwashing after using the washroom, public ECE centres demonstrate exceptional standards, as 90 (90%) of the respondents affirm that there are enough soap dispensers after using the washroom, leading to a high mean score of 4.06 (SD = 0.31). Private centres also fare well in this aspect, with 85% agreeing, resulting in an even higher mean score of 4.13 (SD = 0.37). Both types of centres indicate strong provisions for hygiene practices following bathroom use. Accessibility to hand-washing sinks is critical for promoting good hygiene among young learners. Both public and private ECE centres reported excellent accessibility, with 97 (97%) of the respondents in both categories agreeing that the hand-washing sinks are easily accessible to all learners, yielding identical mean scores of 4.01 (SD = 0.17). This suggests that both types of centres effectively ensure that hand-washing facilities are within reach for children.

The availability of running water at hand-washing sinks is another essential factor in maintaining hygiene. In public centres, 92 (92%) of the respondents reported that there is always running water available, resulting in a mean score of 4.02 (SD = 0.28). Similarly, private centres report that 89 (89%) of the respondents agree on the availability of running water, with a comparable mean score of 4.03 (SD = 0.33). This consistency across both types of centres indicates a strong commitment to ensuring that learners have access to necessary facilities for hygiene. Child-friendliness of washroom

facilities, such as the presence of appropriate toilet seats and accessible sinks, is another area of concern. Public centres exhibit mixed results, with only 43 (43%) agreeing that their washrooms have child-friendly facilities, leading to a mean score of 2.99 (SD = 1.17). Private centres show a slightly lower percentage, with 42 (42%) agreeing, resulting in a mean score of 2.82 (SD = 1.03). This suggests that both public and private centres need to improve their washroom facilities to better accommodate young children.

Finally, regarding the stocking of essential supplies like soap and toilet paper, public centres report that 86 (86%) of washrooms are regularly stocked, with a mean score of 4.05 (SD = 0.41). Private centres exhibit a similar level of satisfaction, with 86 (86%) also agreeing, yielding a mean score of 4.09 (SD = 0.35). This indicates that both types of centres maintain a consistent standard in ensuring that essential hygiene supplies are readily available for students.

Research Question Four: What strategies can be adopted to improve the quality of physical learning environments in public and private ECE centres in Ho Municipality? The research question sought to identify effective measures that enhance the educational spaces available for early childhood learners. By examining both public and private ECE centres, this inquiry aimed to provide actionable recommendations for improving classroom layouts, resource availability, and overall facility quality. The findings in Table 4.8 are intended to guide educators and policymakers in creating optimal learning environments that foster children's engagement and development, thereby contributing to the enhancement of early childhood education in the region.

Table 4. 8: Strategies can be adopted to improve the quality of physical learning environments **(N=200)**

Variable	Type of ECE Centre	SD %	D %	N %	A %	SA %	Mean	SD
Well-equipped walls with stimulating and age-appropriate educational materials.	Public	1 (1%)	0 (0%)	0 (0%)	92(92%)	7 (7%)	4.08	0.27
	Private	0 (0%)	0 (0%)	0 (0%)	85(85%)	15 (15%)	4.15	0.36
Implementing flexible seating arrangements and user-friendly furniture in classrooms.	Public	0 (0%)	0 (0%)	0 (0%)	68(68%)	32 (32%)	4.32	0.47
	Private	0 (0%)	0 (0%)	0 (0%)	80(80%)	20 (20%)	4.19	0.39
Providing a variety of hands-on learning materials and manipulative.	Public	0 (0%)	0 (0%)	0 (0%)	79(79%)	21 (21%)	4.21	0.41
	Private	0 (0%)	0 (0%)	0 (0%)	72(72%)	28 (28%)	4.27	0.45
Encouraging collaboration and group work through classroom layout and design.	Public	2 (2%)	7 (7%)	0 (0%)	60(60%)	31 (31%)	4.11	0.88
	Private	1 (1%)	5 (5%)	0 (0%)	55(55%)	39 (39%)	4.26	0.79
Making washroom facilities accessible and easy to use.	Public	2 (2%)	6 (6%)	0 (0%)	67(67%)	25 (25%)	4.07	0.82
	Private	3 (3%)	5 (5%)	1 (1%)	61(61%)	30 (30%)	4.06	0.93
Providing enough soap and water for hand-washing.	Public	2 (2%)	5 (5%)	6 (6%)	40(40%)	47 (47%)	4.25	0.93
	Private	10(10%)	2 (2%)	1 (1%)	42(42%)	45 (45%)	4.09	1.19
Corners of the classroom should be designated for learning centres.	Public	0 (0%)	0 (0%)	0 (0%)	85(85%)	15 (15%)	4.15	0.36
	Private	0 (0%)	0 (0%)	0 (0%)	70(70%)	30 (30%)	4.28	0.45
Strategies or tools should be provided for to manage and reduce noise level when needed.	Public	0 (0%)	0 (0%)	3 (3%)	80(80%)	17 (17%)	4.14	0.43
	Private	0 (0%)	0 (0%)	3 (3%)	75(75%)	22 (22%)	4.18	0.46

There should be adequate ventilation in the classroom to ensure fresh air circulation.	Public	0 (0%)	0 (0%)	0 (0%)	73(73%)	27 (27%)	4.27	0.45
	Private	0 (0%)	0 (0%)	0 (0%)	78(78%)	22 (22%)	4.21	0.41
Artificial lighting system should be provided to enhance the learning environment.	Public	0 (0%)	0 (0%)	0 (0%)	80(80%)	20 (20%)	4.20	0.40
	Private	0 (0%)	0 (0%)	0 (0%)	79(79%)	21 (21%)	4.20	0.40
The walls of the classroom should be painted with colours that are appropriate for the age group of learners.	Public	0 (0%)	0 (0%)	0 (0%)	88(88%)	12 (12%)	4.12	0.33
	Private	0 (0%)	0 (0%)	0 (0%)	91(91%)	9 (9%)	4.09	0.29

Source: Field Data (2024).

A notable emphasis is placed on the need for well-equipped walls adorned with stimulating and age-appropriate educational materials. In public centres, an impressive 92 (92%) of the respondents agreed with this statement, resulting in a mean score of 4.08 (SD = 0.27). Private centres display slightly higher satisfaction, with 85 (85%) agreeing and achieving a mean score of 4.15 (SD = 0.36). This indicates a shared recognition of the importance of visually stimulating environments to enhance learning. The implementation of flexible seating arrangements and user-friendly furniture is another area where the respondents express strong agreement. In public centres, 68 (68%) affirm the need for such arrangements, contributing to a high mean score of 4.32 (SD = 0.47). Private centres reflect similar sentiments, with 80 (80%) agreeing and a mean score of 4.19 (SD = 0.39). These findings suggest a shared recognition across both centre types of the value of educational displays and adaptable furniture in supporting diverse learning needs.

Providing a variety of hands-on learning materials and manipulative is also viewed as essential for fostering engagement. Public centres receive substantial support for this strategy, with 79 (79%) of the respondents agreeing, leading to a mean score of 4.21 (SD = 0.41). Private centres echo this sentiment, with 72 (72%) agreeing and a mean score of 4.27 (SD = 0.45). This consistency across both types of centres underscores the importance of tactile learning experiences in early childhood education. Encouraging collaboration and group work through classroom layout and design is another identified strategy. In public centres, 60 (60%) agreed with this approach, resulting in a mean score of 4.11 (SD = 0.86). Private centres show a slightly higher percentage of agreement at 55 (55%), but with a higher mean score of 4.26 (SD = 0.79). This indicates a recognition of both types of centres of the value of cooperative learning and the role of physical space in facilitating collaborative activities.

Accessibility and ease of use of washroom facilities are highlighted as critical considerations. In public centres, 67 (67%) agreed that washroom facilities should be made accessible, yielding a mean score of 4.07 (SD = 0.82). Private centres report similar results, with 61 (61%) agreeing and a mean score of 4.06 (SD = 0.93). This reflects a shared commitment to ensuring that essential facilities cater to the needs of young learners. The provision of sufficient soap and water for hand-washing is also deemed vital for promoting hygiene practices. Public centres indicate that 40 (40%) of the respondents agreed with this statement, leading to a mean score of 4.25 (SD = 0.93). In private centres, the agreement is slightly higher at 42 (42%), with a mean score of 4.09 (SD = 1.19). This highlights the consensus on the necessity of maintaining hygiene standards in public and private ECE settings.

The designation of corners within the classroom for specific learning centres is highly regarded. In public centres, 85 (85%) of the respondents agree with this approach, resulting in a mean score of 4.15 (SD = 0.36). In private centres, this support is even stronger, with 70 (70%) agreement and a higher mean score of 4.28 (SD = 0.45). This indicates a recognition of the importance of structured spaces that facilitate various learning activities, promoting engagement and organisation. Managing and reducing noise levels is another critical consideration in the classroom. In public centres, 80 (80%) of the respondents indicate a need for strategies or tools to control noise, yielding a mean score of 4.14 (SD = 0.48). Similarly, private centres show a strong consensus, with 75 (75%) agreeing and a mean score of 4.18 (SD = 0.46). This suggests a shared understanding of both settings of the impact of noise on learning and the necessity for effective management techniques.

The importance of adequate ventilation to ensure fresh air circulation is also emphasised. In public centres, 73 (73%) agreed that proper ventilation is essential, leading to a mean score of 4.27 (SD = 0.45). Private centres show a slightly higher agreement at 78 (78%), resulting in a mean score of 4.21 (SD = 0.41). This reflects a collective commitment of both settings to maintaining a healthy and comfortable classroom environment, which is vital for student well-being and focus.

The provision of an artificial lighting system to enhance the learning environment is similarly endorsed. In public centres, 80 (80%) of the respondents agreed that effective lighting is crucial, with a corresponding mean score of 4.20 (SD = 0.40). Private centres echo this sentiment, with 79 (79%) agreement and a matching mean score of 4.20 (SD = 0.40). This consensus underscores the significance of lighting in supporting visual clarity and creating an inviting atmosphere conducive to learning in public and private ECE settings.

Finally, the colour of classroom walls is regarded as an essential factor in creating an age-appropriate environment. In public centres, 88 (88%) of the respondents agreed that the walls should be painted with suitable colours, yielding a mean score of 4.12 (SD = 0.33). Private centres also reflect strong agreement, with 91 (91%) supporting this notion and a mean score of 4.09 (SD = 0.29). This highlights the importance of aesthetics in fostering a welcoming and stimulating educational setting in both settings.

4.3 Analyses of Hypotheses

Quality of Indoor Spaces of Public and Private ECE Centres

This research hypothesis aimed to examine whether there is a statistically significant difference in the quality of indoor spaces between public and private ECE centres in the Ho Municipality of the Volta Region. To investigate this, independent samples t-

test was conducted, comparing the mean quality scores of indoor spaces in both public and private centres. Data was collected from 100 public and 100 private centres. The findings from the analysis are presented in Table 4.9.

Table 4.9 presents the independent samples t-test results on the quality of indoor spaces in the Ho Municipality's public and private ECE centres.

Table 4. 9: Independent Samples T-test on the Indoor Spaces of public and private ECE centres

Variables	Type of ECE Centre	N	Mean	Std. Deviation	t	DF	P-value
Quality of Indoor spaces of public and private ECE centres	public	100	3.96	0.69	7.29	198	< 0.001
	private	100	3.19	0.80			

Source: Field Data (2024). **significant at p=0.05 (2-tailed)**

The table shows that public ECE centres had a higher mean score (M=3.96; SD=0.69) than private ECE centres, which had a lower mean score (M=3.19; SD=0.80). This indicates that public ECE centres offer better indoor space quality than private ECE centres. The standard deviation for private centres (SD=0.80) suggests that the quality of indoor spaces varied more across different private centres compared to public centres (SD=0.69).

When the mean scores of public and private centres were tested using independent samples t-test at a 5% significance level (two-tailed), the results revealed a statistically significant difference between the two groups ($t(198)=7.29$, $p < 0.001$). Given that the p-value is less than 0.05, we reject the null hypothesis, which posits that there is no statistically significant difference in the quality of indoor spaces between public and private ECE centres. Consequently, we conclude that there is a significant difference,

indicating that public ECE centres offer higher quality indoor spaces compared to private ECE centres.

Spatial Quality of Public and Private ECE Centres

This hypothesis aimed to explore whether there is a statistically significant difference in the spatial quality of public and private ECE centres in the Ho Municipality of the Volta Region. To assess this, an independent samples t-test was conducted, comparing the average spatial quality scores between the two types of centres. Data was collected from 100 public and 100 private centres. The results of the analysis are presented in Table 4.10.

Table 4. 10: Independent Samples T-test on the Spatial Quality of public and private ECE centres

Variables	Type of ECE Centre	N	Mean	Std. Deviation	t	DF	P-value
Spatial quality of public and private ECE centres	public	100	3.80	0.93	4.11	198	< 0.001
	private	100	3.22	1.06			

Source: Field Data (2024). **significant at p=0.05 (2-tailed)**

The findings from Table 4.10 reveal that public ECE centres had a mean score of 3.80 (SD = 0.93), while private ECE centres reported a lower mean score of 3.22 (SD = 1.06). This indicates that public centres offer superior spatial quality in comparison to private centres.

The independent samples t-test produced a t(198) = 4.11 and a p-value of < 0.001. Given that this p-value is significantly lower than the significance threshold of 0.05, we reject the null hypothesis, which states that there is no statistically significant difference in spatial quality between the two types of centres. Consequently, we conclude that there

is a significant difference in spatial quality, with public ECE centres providing significantly better spatial quality than their private counterparts.

Facilities of Public and Private ECE Centres

This hypothesis sought to determine whether a statistically significant difference exists in the facilities provided by public and private ECE centres within the Ho Municipality of the Volta Region. Independent samples t-test was performed to compare the average facility scores between the two types of centres. Data was gathered from 100 public and 100 private centres. The results of the analysis are shown in Table 4.11.

Table 4. 11: Independent Samples T-test on public and private ECE centre facilities.

Variables	Type of ECE Centre	N	Mean	Std. Deviation	t	DF	P-value
Facilities of public and private ECE centres	public	100	3.75	0.59	0.61	198	0.543
	private	100	3.70	0.57			

Source: Field Data (2024). **significant at p=0.05 (2-tailed)**

The data indicate that public ECE centres had a mean score of 3.75 (SD = 0.59), while private ECE centres had a mean score of 3.70 (SD = 0.57). This suggests that public centres slightly outperformed private centres in terms of facilities.

The independent samples t-test resulted in a t(198) = 0.61 with a p-value of 0.543. Since this p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis, which posits that there is no statistically significant difference in the facilities between public and private ECE centres. Therefore, we conclude that there is no significant difference in the facilities available at public and private ECE centres,

indicating that both types of centres provide comparable facilities for early childhood education.

4.4 Discussion of Results

4.4.1 What is the quality of indoor space of public and private ECE centres in the Ho Municipality?

The results from this study reveal a stark contrast between public and private early childhood education (ECE) centres in terms of furniture organisation, space management, and the support provided for diverse learning activities. In public ECE centres, a majority of respondents expressed positive perceptions regarding the organisation of classroom furniture and the ability of learners to move freely within the classroom. In contrast, private centres were perceived as more cluttered, with inconsistent furniture arrangements. These results are consistent with existing literature that emphasises the importance of an organised classroom environment in supporting early learning. According to Ritchie and Howes (2021), a well-structured physical environment in early childhood settings promotes active learning and enables children to engage more meaningfully with educational activities.

Additionally, the study highlights the superior performance of public ECE centres in terms of furniture arrangement allowing for easy movement around the classroom, with public centres being more conducive to easy movement and interaction. This aligns with research by Chien et al. (2019), which suggests that spatial organisation in early childhood classrooms plays a critical role in supporting children's independence, movement, and peer engagement. On the other hand, the results in private centres indicate a lack of space optimisation, potentially limiting children's ability to explore their classroom environment freely, which could hinder the development of motor skills

and social interactions (Bullard, 2017). The results also show that public ECE centres are more effective at providing classroom setups that support different learning activities and group interactions. This holds particular significance in the context of early childhood education, as research has shown that flexible and adaptable learning environments allow for varied teaching methods, including play-based learning, group work, and individual tasks (Hirst & Schwab, 2019). The lower performance in private centres suggests that these institutions may not be prioritising the flexibility of classroom layouts to the same extent, possibly impacting the quality of the learning experience for children.

In terms of ergonomics, both public and private centres were reported to provide seating arrangements that ensure learners' feet rest comfortably on the floor and offer supportive surfaces for learners to lean against. This is a critical aspect of classroom design, as poor seating arrangements can lead to physical discomfort and distract learners from their educational activities. Ergonomically designed classrooms have been linked to improved concentration and learning outcomes in young children (Durlak et al., 2020).

One of the more concerning results from the study is the significant disparity between public and private centres regarding the safety of classroom furniture. Public centres were perceived as having more furniture designed to prevent injury, while private centres were noted for less attention to safety features, such as rounded edges on furniture. This is a crucial issue, as safety in ECE settings is fundamental to ensuring that children can explore their environment without risk of harm. Research by Morrow and Battistich (2020) underscored the importance of creating safe and child-friendly environments in early learning settings to minimise risks and accidents.

The presence of designated learning centres within classrooms was more prevalent in public centres compared to private ones, with public centres also having better layouts to support their use. Learning centres, which offer opportunities for focused activities in areas such as literacy, numeracy, and creative arts, are a key feature of effective early childhood classrooms. Studies, such as those by Copple and Bredekamp (2019), have shown that learning centres foster independent exploration, creativity, and collaboration among young learners, making them an essential element of quality early childhood education.

This suggests that public centres provide more holistic learning experiences, catering to the diverse developmental needs of children. Private centres, however, were perceived as offering a narrower range of subjects, which could limit children's exposure to various learning domains. A broad curriculum is essential in early childhood education, as it supports cognitive, social, and emotional development (Siraj-Blatchford & Sylva, 2019).

Another significant result is the difference in the labelling and identification of learning centres between public and private centres. Public centres were noted for having clearer labelling of learning centres, which makes it easier for children to navigate their environment and engage with activities. The literature supports the idea that clear visual cues in the classroom, such as labels and signs, help young children to understand their surroundings and develop independence (Pianta et al., 2021). In contrast, the lack of clear labelling in private centres could contribute to confusion and reduce the effectiveness of learning centres as a tool for self-directed learning.

Finally, the study indicates that public centres perform better in terms of fostering learner engagement and participation at learning centres. This could be attributed to the

more organised and flexible classroom environments found in public centres, which, as noted by Miller et al. (2020), play a pivotal role in encouraging active learning. Public centres were also found to be more successful in promoting independent exploration and discovery, which are critical aspects of early childhood education. Research by Hohmann and Weikart (2020) highlighted the importance of fostering children's innate curiosity and offering them chances for experiential learning, a practice that appears to be more effectively implemented in public ECE centres than in private ones.

In conclusion, the results of this study align with existing literature that emphasises the importance of physical classroom environments in early childhood education. Public ECE centres generally outperform private centres in terms of furniture organisation, space management, and support for diverse learning activities. This has significant implications for the quality of education offered in private centres, suggesting a need for improvements in classroom design and safety features to enhance the learning environment for young children.

4.4.2 What is the spatial quality of public and private ECE centres in the Ho Municipality?

The results of the study highlight significant differences between public and private early childhood education (ECE) centres regarding spatial quality, particularly in relation to ventilation, noise levels, and the classroom environment. These differences have important implications for the quality of the learning environment, which is known to impact children's cognitive, social, and emotional development. In terms of noise management, public ECE centres demonstrated greater satisfaction compared to private centres. The majority of respondents from public centres reported that background noise from outside the classroom does not significantly disrupt learning activities, while

a higher proportion of private centre respondents indicated that noise was an issue. This aligns with the literature, which emphasises the importance of a quiet classroom environment for effective learning. For example, Shield and Dockrell (2019) argued that excessive noise in classrooms can negatively impact children's concentration and academic performance, particularly in early childhood settings where children are developing foundational skills.

The ability to communicate clearly without raising one's voice was another area where public centres outperformed private ones. A large proportion of public centre respondents agreed that they could effectively communicate with students without the need for raised voices, whereas private centres struggled more in this regard. Research by Johnson and Davies (2020) highlighted that effective communication in classrooms is essential for young children's language development and social interaction. A noisy or acoustically poor environment can hinder teachers' ability to communicate instructions clearly, thus affecting learning outcomes.

Moreover, public centres reported that the classroom setup helps in reducing noise levels, which contributes to a conducive learning environment. This result supports studies by Maxwell and Evans (2020), who found that thoughtful classroom design, including the arrangement of furniture and materials, can significantly mitigate the effects of noise and create a more focused learning space. On the other hand, the lower satisfaction with noise management in private centres suggests a need for better spatial planning to enhance the auditory environment for learners.

In relation to ventilation, public centres reported higher satisfaction with both natural and mechanical ventilation systems compared to private centres. Adequate ventilation is crucial in maintaining a healthy learning environment, as poor air circulation can lead to discomfort and even health issues, particularly for young children (Wargocki & Fanger, 2019). The relatively lower satisfaction in private centres suggests that these institutions may not be prioritising air quality to the same extent as public centres. This result is supported by research showing that well-ventilated classrooms can enhance cognitive performance by ensuring that children remain comfortable and alert throughout the day (Haverinen-Shaughnessy & Shaughnessy, 2021).

Public centres also reported better air quality, which is vital for ensuring that children are not exposed to harmful pollutants or poor indoor air conditions that could lead to respiratory issues (Mendell & Heath, 2020). The higher satisfaction with air quality in public centres could be attributed to better-maintained infrastructure and more regular checks on ventilation systems.

The results also show that public ECE centres reported satisfaction with classroom lighting and wall colours. Appropriate lighting is essential for creating an environment conducive to learning, as it helps reduce eye strain and ensures that children can focus on their tasks without discomfort (Veitch & Newsham, 2019). Public centres were found to have better artificial lighting that enhanced the learning environment, which aligns with research by Barrett et al. (2021) showing that well-lit classrooms contribute to improved academic performance.

Similarly, public centres reported higher satisfaction with the appropriateness of wall colours for young learners. According to Pellow and Armitage (2020), age-appropriate and visually stimulating environments can positively impact children's mood and

behaviour, creating a more welcoming and engaging classroom atmosphere. The slightly lower satisfaction in private centres suggests that these institutions may need to reconsider their classroom design to better cater to the needs of young learners.

Another critical result is the significant difference in satisfaction with teaching and learning resources (TLRs) between public and private centres. Public centres reported more frequent updates of TLRs to reflect current educational practices and were more likely to provide resources that foster hands-on exploration, creativity, and imagination. This is consistent with the literature, which emphasises the importance of updated and interactive resources in early childhood education. According to Siraj-Blatchford and Sylva (2019), well-maintained and age-appropriate resources are essential for supporting children's developmental needs and promoting active learning.

Public centres were also more likely to report that their TLRs foster creativity and imagination among learners, as evidenced by the higher satisfaction levels in these centres. This result supports the notion that public ECE centres are better equipped to offer stimulating environments that encourage hands-on exploration, which is a key component of early childhood education (Fleer & Ridgeway, 2019). In contrast, private centres showed lower engagement with updating their resources, which could limit the avenues for children to participate in imaginative and exploratory learning experiences.

In conclusion, the results suggest that public ECE centres offer a more conducive spatial learning environment than private centres. This is reflected in better noise management, ventilation, lighting, and the provision of TLRs that support creativity and exploration. Private centres need to invest more in improving these aspects to enhance the learning experience for young children.

4.4.3 To what extent do public and private ECE centres in Ho Municipality differ in terms of facilities?

The analysis of facilities, specifically focusing on washrooms and hand-washing stations, highlights noteworthy differences between public and private early childhood education centres. In public early childhood education centres, a significant percentage of respondents agree that washroom facilities are cleaned multiple times a day and maintained in good condition. In contrast, private centres show slightly lower satisfaction regarding the cleanliness and condition of the facilities. This indicates that public centres are perceived to have superior maintenance of washroom facilities compared to private ones. Regular cleaning of washroom facilities is crucial for preventing the spread of infections among children, as young children are particularly vulnerable to illnesses (Nicolopoulou, 2019; Duah, 2024; Quartey et al., 2024). The higher reported cleanliness in public centres could reflect better resource allocation and prioritisation of hygiene standards, which is vital for creating a safe learning environment (Baker & McDonald, 2020). This aligns with the findings of Haverinen-Shaughnessy et al. (2021), who emphasise the importance of well-maintained sanitation facilities in promoting children's health in educational settings.

When evaluating the availability of soap dispensers for handwashing, public early childhood education centres demonstrate exceptional standards, as a high percentage of respondents affirm that there are enough soap dispensers after using the washroom. Private centres also fare well in this aspect, with an even higher percentage agreeing. Both types of centres indicate strong provisions for hygiene practices following bathroom use. This reflects a commitment to fostering good hygiene habits among young children, which is essential for preventing the transmission of germs (Amin et al., 2020, Quartey et al., 2024). Access to soap is particularly important, as it is a critical

component in effective handwashing, which has been shown to significantly reduce the incidence of respiratory and diarrheal infections in young children (Luby et al., 2020).

Accessibility to hand-washing sinks is critical for promoting good hygiene among young learners. Both public early childhood education centres and private early childhood education centres report excellent accessibility, suggesting that both types of centres effectively ensure that hand-washing facilities are within reach for children. Ensuring that hand-washing facilities are easily accessible is essential for encouraging children to wash their hands regularly, thus promoting overall health and well-being (O'Connor et al., 2018). This accessibility aligns with recommendations from the World Health Organisation (WHO, 2020), which advocated for easy access to hand-washing facilities in schools to foster good hygiene practices.

The availability of running water at hand-washing sinks is another essential factor in maintaining hygiene. In public early childhood education centres, a high percentage of the respondents report that there is always running water available. Similarly, private centres report a high percentage of respondents agreeing on the availability of running water. This consistency across both types of centres indicates a strong commitment to ensuring that learners have access to necessary facilities for hygiene. Research indicates that consistent access to running water is crucial for effective hand hygiene practices, as it encourages children to wash their hands frequently (World Health Organisation, 2020). The findings highlighted the critical need to allocate resources towards proper sanitation and infrastructure in early childhood settings.

Child-friendliness of washroom facilities, including appropriate toilet seats and accessible sinks, is an area of concern. Public early childhood education centres show mixed results, with only a modest percentage agreeing that their washrooms are child-

friendly, while private centres report an even slightly lower percentage. This indicates that both public and private centres need to enhance their washroom facilities to better meet the needs of young children.

This suggests that public and private early childhood education centres may need to improve their washroom facilities to accommodate young children better. Child-friendly facilities promote independence and self-care among young learners (Rogers et al., 2020). Failure to provide such facilities can hinder children's ability to manage their personal hygiene effectively, impacting their overall well-being.

Finally, regarding the stocking of essential supplies like soap and toilet paper, public early childhood education centres report that a high percentage of washrooms are regularly stocked, while private centres exhibit a similar level of satisfaction. This indicates that both types of centres maintain a consistent standard in ensuring that essential hygiene supplies are readily available for students. In summary, while both public early childhood education centres and private early childhood education centres show commendable practices in several areas, there are clear distinctions in perceptions of washroom facilities, with public centres generally perceived as having better-maintained facilities. However, both types of centres exhibit strengths in hygiene practices, such as the availability of soap dispensers, running water, and stocked supplies, indicating a commitment to maintaining sanitary conditions for young learners.

4.4.4 What strategies can be adopted to improve the quality of physical learning environments in public and private ECE centres in the Ho Municipality?

The analysis of strategies to improve the quality of physical learning environments reveals significant insights from respondents across public and private early childhood

education centres. A notable emphasis is placed on the need for well-equipped walls adorned with stimulating and age-appropriate educational materials. This shared recognition of the importance of visually stimulating environments highlights how such spaces can enhance learning. Research indicates that engaging visuals and materials in learning environments play a crucial role in capturing children's attention and fostering cognitive development (Berk, 2020).

The implementation of flexible seating arrangements and user-friendly furniture is another area where respondents express strong agreement. This positive feedback on flexible seating underscores a collective desire for adaptability in classroom setups to support diverse learning styles. The ability to change seating arrangements can significantly enhance student engagement and collaboration (Jiang et al., 2018). This reflects a growing awareness of the importance of student-centred design in early childhood education settings.

Providing a variety of hands-on learning materials and manipulative is also viewed as essential for fostering engagement. The support for this strategy highlights the importance of tactile learning experiences in early childhood education. Hands-on materials allow children to explore and discover concepts through direct interaction, which is vital for their cognitive and social development (Saracho & Spodek, 2017). This consistency across both types of centres indicates a strong consensus on the necessity of incorporating such resources into the curriculum.

Encouraging collaboration and group work through classroom layout and design is another identified strategy. This indicates a recognition of the value of cooperative learning and the role of physical space in facilitating collaborative activities. Research shows that collaborative learning promotes critical thinking and social skills, essential

components of early childhood education (Gillies, 2016). The arrangement of physical spaces can either hinder or enhance these collaborative efforts, emphasising the importance of intentional classroom design.

Accessibility and ease of use of washroom facilities are highlighted as critical considerations. This reflects a shared commitment to ensuring that essential facilities address the needs of young children. The layout of washroom facilities in educational settings must accommodate the physical needs of children to promote independence and hygiene practices (Drake & Long, 2018). Providing accessible washrooms contributes to a positive learning environment where children feel safe and supported.

The provision of sufficient soap and water for hand-washing is also deemed vital for promoting hygiene practices. This highlights the consensus on the necessity of maintaining hygiene standards in early childhood education settings. Adequate hygiene practices, including access to handwashing facilities, are essential in preventing the spread of infections among children, who are particularly susceptible to illness (Luby et al., 2020).

The designation of corners within the classroom for specific learning centres is highly regarded. This recognition of the importance of structured spaces that facilitate various learning activities promotes engagement and organisation. Research supports the notion that defined learning areas can help children focus and transition between activities more smoothly (Miller & Almon, 2009).

Managing and reducing noise levels is another critical consideration in the classroom. This suggests a shared understanding of the impact of noise on learning and the necessity for effective management techniques. Studies indicate that excessive noise

can negatively affect children's attention spans and overall academic performance (Higgins et al., 2012). Thus, creating a quieter learning environment is essential for enhancing focus and learning outcomes.

The importance of adequate ventilation to ensure fresh air circulation is also emphasised. This reflects a collective commitment to maintaining a healthy and comfortable classroom environment, which is vital for student well-being and focus. Proper ventilation is linked to improved cognitive function and reduced fatigue in learning environments (Wargocki et al., 2002).

The provision of an artificial lighting system to enhance the learning environment is similarly endorsed. This consensus underscores the significance of lighting in supporting visual clarity and creating an inviting atmosphere conducive to learning. Research shows that appropriate lighting can significantly impact students' mood and concentration, influencing their overall learning experience (Higgins et al., 2012).

Finally, the colour of classroom walls is regarded as an essential factor in creating an age-appropriate environment. This highlights the importance of aesthetics in fostering a welcoming and stimulating educational setting. Colour has been shown to affect mood, behaviour, and even academic performance in children, suggesting that thoughtfully chosen colours can enhance the educational experience (Gifford, 2014).

In conclusion, the results highlight the importance of various factors in enhancing the quality of physical learning environments in early childhood education centres. The shared insights from respondents in both public and private centres reveal a collective commitment to creating spaces that support children's learning and development.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This concluding chapter present a summary of the study, highlighting the key findings. It also provides conclusions, offers recommendations, and outlines directions for future research.

5.1 Summary of the Study

The study's main purpose was to compare the quality of the physical learning environment in public and private Early Childhood Education (ECE) centres in Ho Municipality. To accomplish this aim, the research aimed to answer the following key questions:

i. What is the quality of indoor space in public and private Early Childhood Education (ECE) centres in Ho Municipality?
ii. What is the spatial quality of public and private ECE centres in the Ho Municipality?
iii. To what extent do public and private ECE centres in Ho Municipality differ in terms of facilities?
iv. What strategies can be adopted to improve the quality of physical learning environments in public and private ECE centres in Ho Municipality?

Correlational survey design was employed to answer the research questions. For the public Early Childhood Education (ECE) centres, the researcher utilised simple random sampling technique, specifically the lottery method. Out of a total of 284 public school teachers, 100 were randomly selected to participate due to the large population size. In contrast, a census sampling technique was used for the registered private ECE centres.

Since the total number of teachers in these private schools was 100, the researcher opted to include all of them in the study, given the manageable number. A 5-point Likert scale questionnaire was employed as the data collection instrument. The collected data were analysed through both descriptive statistics (such as frequencies, percentages, mean, and standard deviations) and inferential statistics, specifically the independent sample t-test. The key findings of the study are presented in the sections that follow.

5.2 Key Findings

The study revealed the following major findings:

1. The study found that public centres are better organised, with well-arranged furniture, safe and child-friendly designs, and clearly labelled learning centres that support independence and diverse activities. Private centres, however, showed mixed organisation, limited ergonomic furniture, and fewer, less structured learning areas, making it harder to support varied learning experiences.
2. The study revealed that public ECE centres in Ho Municipal generally offer higher spatial quality than private centres, with better noise control, ventilation, lighting, and regularly updated resources that enhance communication, teaching, and creativity. Private centres, however, struggle with noise and resource management, leading to lower satisfaction with their learning environments.
3. The study found that both public and private ECE centres provide strong access to hand-washing facilities, with sinks, running water, and essential supplies readily available. Public centres generally maintain cleaner washrooms, while private centres slightly excel in providing soap dispensers. However, both types of centres show low satisfaction with the availability of child-appropriate toilet seats.
4. The study shows that both public and private ECE centres value visually stimulating walls, flexible seating, hands-on materials, and designated learning corners. Public

centres focus more on ventilation and noise control, while private centres emphasise seating flexibility. Both agree on the importance of aesthetics, accessible washrooms, and hygiene supplies, highlighting a shared commitment to adaptable and engaging learning environments.

5. The analysis showed that public ECE centres in the Ho Municipality scored significantly higher in indoor space quality ($M = 3.96$, $SD = 0.69$) than private centres ($M = 3.19$, $SD = 0.80$). An independent samples t-test confirmed the difference as statistically significant ($t(198) = 7.29$, $p < 0.001$), leading to the rejection of the null hypothesis and confirming that public centres provide better indoor space quality.
6. The analysis revealed that public ECE centres in the Ho Municipality scored significantly higher in spatial quality ($M = 3.80$, $SD = 0.93$) than private centres ($M = 3.22$, $SD = 1.06$). An independent samples t-test confirmed the difference as statistically significant ($t(198) = 4.11$, $p < 0.001$), leading to the conclusion that public centres outperform private centres in spatial quality.
7. The analysis showed that public ECE centres ($M = 3.75$, $SD = 0.59$) scored slightly higher than private centres ($M = 3.70$, $SD = 0.57$) in facilities. However, the independent samples t-test ($t(198) = 0.61$, $p = 0.543$) indicated no statistically significant difference, thus retaining the null hypothesis that facilities in public and private centres do not differ significantly.

5.3 Conclusions

Based on the study's findings, the following conclusions were reached:

1. Public ECE centres provide more organised and supportive environments, with structured classrooms and clearly defined learning areas that promote participation and independence. Private centres, however, often struggle with cluttered and

inconsistently organised spaces, underscoring the need for improvements in layout and safety.

2. Public ECE centres in the Ho Municipal area provide a superior learning environment compared to private centres, excelling in noise control, ventilation, lighting, and teaching resources that foster effective teaching and learning. Private centres, on the other hand, struggle with external noise and classroom conditions, underscoring the need for substantial improvements in their resources.
3. The study found strong hygiene practices in both public and private ECE centres, with clean washrooms, accessible hand-washing facilities, and sufficient supplies. Private centres performed slightly better in providing soap dispensers, but both types of centres lacked adequate child-friendly toilet seats, highlighting the need for improvement in this area.
4. The study revealed that both public and private ECE centres share a common understanding of the importance of improving physical learning environments. They value visually engaging walls, flexible seating, hands-on materials, and dedicated learning corners to support engagement and organisation. Both also emphasise the need for accessible washrooms, hygiene supplies, and highlight noise control, ventilation, and effective lighting as essential for creating optimal learning spaces.

5.4 Recommendations of the Study

In light of the study's finding, the following recommendations were made:

1. The Ho Municipal Education Directorate should prioritise and continuously assess classroom layouts in private ECE centres to improve their safety and learning areas. For public ECE centres, regular professional development workshops should be held to maintain high standards of classroom organisation and safety.

2. The Ho Municipal Education Directorate should improve private ECE centres by investing in soundproofing, ventilation, and lighting. Regular classroom assessments should ensure standards are met. For public centres, ongoing training for educators on noise management and communication strategies will enhance the learning experience for both teachers and students.

3. The Ho Municipal Education Directorate, should sustain existing hygiene practices in both settings (cleaning, running water, soap, supplies) and prioritise upgrading their washrooms with child-friendly facilities such as child-size toilet seats to enhance safety among learners.

4. Finally, the Ho Municipal Education Directorate should organise workshops for early childhood educators to exchange best practices on enhancing classroom environments. The goal is to foster collaboration between public and private centres, creating better learning spaces for young children.

5.5 Suggestions for Further Studies

This study explored the quality of the physical learning environment in public and private Early Childhood Education (ECE) centres in the Ho Municipality. Future research should undertake a comparative assessment of these environments, using a mixed-methods approach. In addition to questionnaires, direct observation of indoor space, spatial quality, and facilities should be employed to capture a fuller picture. Such an approach would provide deeper insights into how differences between public and private centres influence children's holistic development and well-being. The findings would be valuable to educators and policymakers in identifying best practices for enhancing early years learning environments.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FOR KINDERGARTEN TEACHERS

UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF APPLIED AND BEHAVIOURAL SCIENCES

DEPARTMENT OF EARLY CHILDHOOD EDUCATION

Dear Respondent,

I am Charity Anyidoho, a Master of Philosophy candidate at the University of Education, Winneba. The primary aim of this study is to assess and compare the quality of physical learning environments in public and private ECE centres in the Ho municipal. By examining various aspects of the physical environment such as indoor space (seating arrangements and learning centres), spatial quality (noise level, ventilation, teaching and learning resources, room design), and facilities (washrooms and hand-washing stations), the researcher seek to identify potential areas of strength and areas needing improvement. This analysis will provide valuable insights into how different types of ECE providers prioritize and implement elements that contribute to an effective and stimulating physical learning environment for young learners.

Your participation is crucial in providing first-hand observations and experiences related to the physical learning environments of your ECE centres. Also, your responses will be kept confidential, and your identity will remain anonymous throughout the study.

The findings from this study will be used to advocate for improvements in both private and public ECE centres, with the aim of elevating the overall quality Early Childhood Education physical learning environment within the Ho municipality.

Instruction: Kindly respond by placing a tick (√) in the appropriate box and providing written responses where necessary.

SECTION A
BIO DATA

1. Sex

Male [ ]

Female [ ]

2. Age Range

18 – 20 [ ]

21 – 30 [ ]

31- 40 [ ]

41-50 [ ]

51-60 [ ]

61 and above [ ]

3. Academic Qualification

WASSCE [ ]

Diploma [ ]

Degree [ ]

Masters [ ]

Other

(Specify)……

4. Area of Specialisation

Early Childhood Education [ ]

Basic Education [ ]

Other

(Specify)……

5. Number of Years in Service as Kindergarten Teachers

0 - 5 years [ ]

6 - 10 years [ ]

11 - 15 years [ ]

16 - 20 years [ ]

21 years and above [ ]

6. Type of ECE Centre

Public [ ]

Private [ ]

SECTION B

DATA ON RESEARCH OBJECTIVES

Indoor space (seating arrangement and learning centres) of public and private Early Childhood Education (ECE) centres in Ho Municipal.

The table below presents data on the seating arrangements and learning centres of public and private Early Childhood Education (ECE) centres in Ho Municipal. Please read each statement carefully and show how much you agree or disagree by ticking (√) the appropriate box: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), and 5 = Strongly Agree (SA).

S/N	Statements	S D (1)	D 2)	N (3)	A (4)	S A (5)
7	The classroom furniture is well organised and free from clutter.					
8	The furniture arrangement allows for easy movement around the classroom.					
9	The classroom setup supports different learning activities and group interactions.					
10	The learner's feet rest comfortably on the floor when they are seated on the chair.					
11	The learners lean against a supportive surface to relax their back.					
12	There is a table available for learners to place their books on and comfortably rest their arms while writing.					
13	The edges of the furniture are designed to prevent injury.					
14	There are learning centres in my classroom.					
15	The physical layout of the classroom supports effective use of learning centres.					
16	The learning centres covers a range of subjects, including math, literacy, science, and art.					
17	Each learning centre is clearly labelled and easy for learners to identify.					
18	Learners are engaged and actively participate in activities at the learning centres.					
19	The learning centres encourage independent exploration and discovery.					
20	The materials at the learning centres are safe and free from hazards.					

SECTION C

Spatial quality (ventilation, noise level, learning materials, room colour, lighting) of public and private ECE centres in Ho Municipal.

The table below presents data on spatial quality (ventilation, noise level, learning materials, room colour, and lighting) of public and private ECE centres in Ho Municipality. Please read each statement carefully and show how much you agree or disagree by ticking (√) the appropriate box: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), and 5 = Strongly Agree (SA).

S/N	Statements	S D (1)	D (2)	N (3)	A (4)	S A (5)
21	Background noise from outside the classroom does not disrupt learning activities.					
22	The classroom environment allows for clear communication with learners during lessons without raising my voice.					
23	The classroom setup helps in reducing noise levels.					
24	I am satisfied with the current noise level and setup in my classroom.					
25	The classroom setup allows for adequate ventilation to ensure fresh air circulation.					
26	The classroom has mechanical ventilation system (fans or air conditioners) that functions well.					
27	The air quality in the classroom is good and does not cause discomfort or health issues to learners.					
28	There is an artificial lighting in my classroom that enhances the learning environment.					
29	The walls of the classroom are painted with colours that are appropriate for the age group of my learners.					
30	The walls are decorated with informative and age-appropriate learning aids (charts, pictures).					
31	The TLRs are regularly updated to reflect current educational practices for learners.					
32	The TLRs encourages hands-on exploration, creativity and imagination among learners.					
33	I am satisfied with the Teaching and Learning Resources in my classroom.					

SECTION D

Facilities (hand-washing and washroom facilities) of public and private ECE centres in Ho Municipality

The following table illustrate data on the facilities of public and private ECE centres in Ho Municipality. Please read each statement carefully and show how much you agree or disagree by ticking (√) the appropriate box: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), and 5 = Strongly Agree (SA).

S/N	Statements	S D (1)	D (2)	N (3)	A (4)	S A (5)
34	The washroom facilities are cleaned multiple times a day and kept in good condition.					
35	There are enough soap dispensers for students to wash their hands after using the washroom.					
36	The hand-washing sinks are easily accessible to all learners.					
37	There is always running water available at the hand-washing sinks.					
38	The washrooms have child-friendly facilities (e.g., toilet seats, accessible sinks).					
39	Washrooms are regularly stocked with essential supplies like soap and toilet paper.					

SECTION E

Strategies to improve the quality of physical learning environments in public and private ECE centres in Ho Municipality.

The table below presents data on strategies that can be adopted to improve the quality of physical learning environments in public and private ECE centres in Ho Municipality. Please read each statement carefully and show how much you agree or disagree by ticking (√) the appropriate box: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), and 5 = Strongly Agree (SA).

S/N	Statements	S D (1)	D (2)	N (3)	A (4)	S A (5)
40	Well-equipped walls with stimulating and age-appropriate educational materials.					
41	Implementing flexible seating arrangements and user friendly furniture in classrooms.					
42	Providing a variety of hands-on learning materials and manipulative.					
43	Encouraging collaboration and group work through classroom layout and design.					
44	Making washroom facilities accessible and easy to use.					
45	Providing enough soap and water for hand-washing.					
46	Corners of the classroom should be designated for learning centres.					
47	Strategies or tools should be provided for to manage and reduce noise level when needed.					
48	There should be adequate ventilation in the classroom to ensure fresh air circulation.					
49	Artificial lighting system should be provided to enhance the learning environment.					
50	The walls of the classroom should be painted with colours that are appropriate for the age group of learners.					

THANK YOU FOR YOUR PARTICIPATION

APPENDIX B

LETTER OF INTRODUCTION

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF APPLIED BEHAVIOURAL SCIENCES IN EDUCATION
DEPARTMENT OF EARLY CHILDHOOD CARE AND DEVELOPMENT
P. O. Box 25, Winneba, Ghana

FABSE/DECE/L.1

9th May, 2024

The Director
Ghana Education Service
P.O. Box 94
Ho-Volta Region

Dear Sir/ Madam,

INTRODUCTORY LETTER

I kindly write to introduce to you **Ms. Charity Anyidoho** with index number:**8231900001** who is an M.PHIL. student at the Department of Early Childhood Care and Development, University of Education, Winneba. She is in her final year and has to embark on her thesis on the topic ***"Comparative Assessment of the quality of Early Childhood Physical Environment in Public and Private settings in Ho Municipality".***

Ms. Charity Anyidoho is to collect data for her thesis, and I would be most grateful if she could be given the needed assistance.

Thank you.

Yours faithfully,

DR. MICHAEL SUBBEY
HEAD OF DEPARTMENT

www.uew.edu.gh

APPENDIX C

INTRODUCTORY LETTER FROM GES

GHANA EDUCATION SERVICE

HO MUNICIPAL DIRECTORATE

P. O. Box 94, Ho, Volta Region

Email: [illegible]

Facebook: GES Ho Municipal Directorate

Our Ref: GES/VR/HMD.841/101

Your Ref:

Tel: 0242530251

Digital Address: VH-0015-4038

REPUBLIC OF GHANA

21ST MAY, 2024

ALL HEADS OF 1ST & 2ND CYCLE SCHOOLS
HO MUNICIPALITY

LETTER OF INTRODUCTION
MISS CHARITY ANYIDOHO

We write to introduce to you Miss Charity Anyidoho who is an M.PHIL. student of the Department of Early Child Care and Development at the University of Education, Winneba.

She is currently embarking on her thesis.

Kindly accord the needed assistance that she needs in her data collection and other relevant activities that will help her to complete her thesis on time.

Thank you.

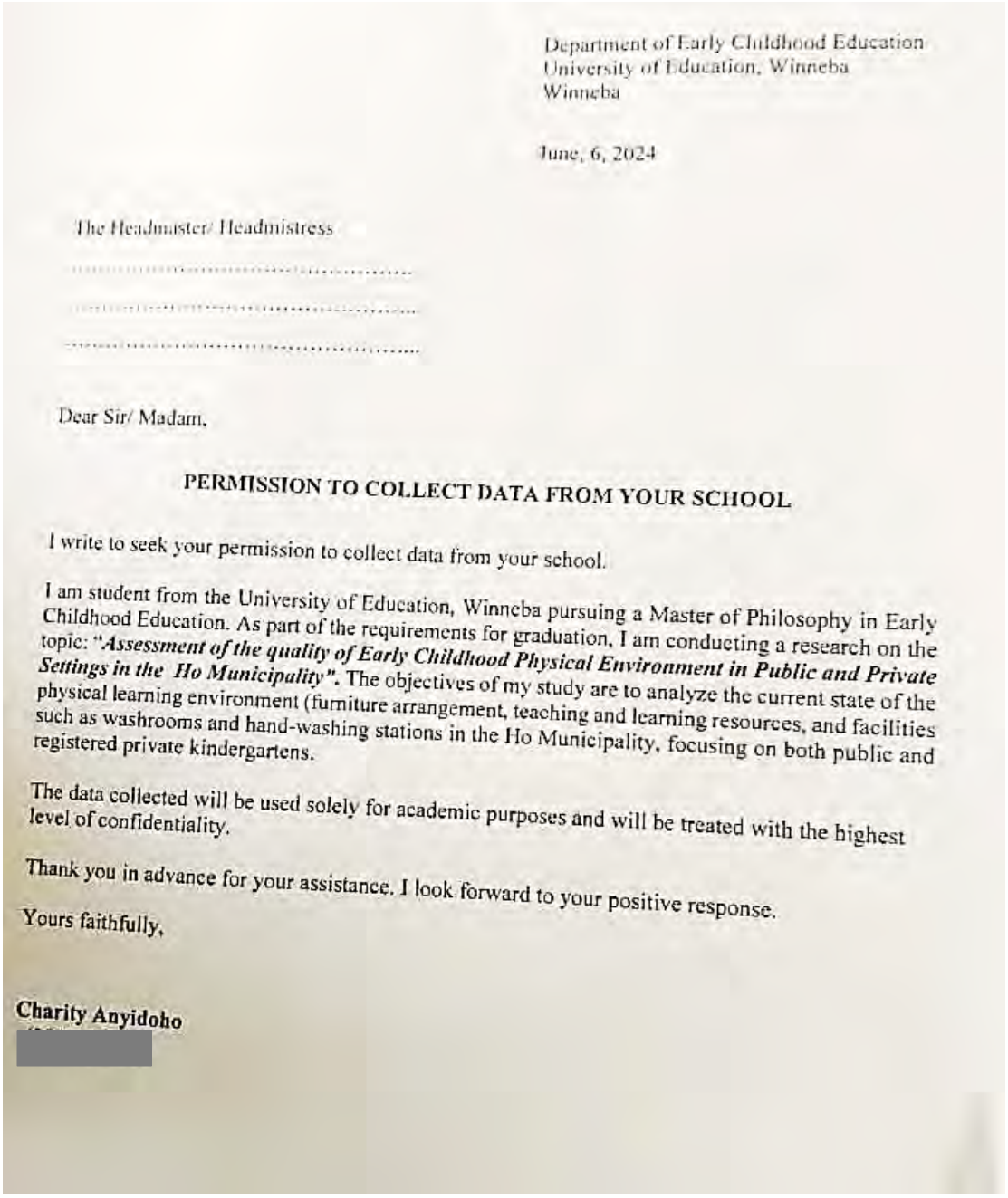
ESTHER ADZO YEBOAH-ADZIMAH(Ed.D)
MUNICIPAL DIRECTOR
GHANA EDUCATION SERVICE
MUNICIPAL OFFICE
HO, VR

Cc:
The Head of Dept.
Depart. Of Early Childhood Care & Develop.
University of Education
Winneba

Miss Charity Anyidoho
Ho

APPENDIX D

PERMISSION LETTER



Department of Early Childhood Education
University of Education, Winneba
Winneba

June, 6, 2024

The Headmaster/ Headmistress
.....
.....
.....

Dear Sir/ Madam,

PERMISSION TO COLLECT DATA FROM YOUR SCHOOL

I write to seek your permission to collect data from your school.

I am student from the University of Education, Winneba pursuing a Master of Philosophy in Early Childhood Education. As part of the requirements for graduation, I am conducting a research on the topic: "***Assessment of the quality of Early Childhood Physical Environment in Public and Private Settings in the Ho Municipality***". The objectives of my study are to analyze the current state of the physical learning environment (furniture arrangement, teaching and learning resources, and facilities such as washrooms and hand-washing stations in the Ho Municipality, focusing on both public and registered private kindergartens.

The data collected will be used solely for academic purposes and will be treated with the highest level of confidentiality.

Thank you in advance for your assistance. I look forward to your positive response.

Yours faithfully,

Charity Anyidoho
[redacted]