LEVEL OF UTILIZATION OF SCIENCE FACILITIES IN EARLY CHILDHOOD CLASSROOMS IN OREDO LOCAL GOVERNMENT AREA, EDO STATE

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CERTIFICATION

We, the assigned ,certify that this project work was carried out by Etoama Peace Chiamaka with matriculation number Edu1803682 of the Institute of Education, University of Benin, Benin City in partial fulfillment of the requirement for the award of Bachelors Degree in Education (B.Ed) in Early Childhood Education.

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DEDICATION

This project work is dedicated to Almighty God for enabling me to go through the course. To my Father, Mr. Valentine Nwaimo, for his prayers and encouragement, My mother, Late Mrs. Faustina Nwaimo for her spiritual guidance and to my family for their support and contribution towards the success of this project and my academic achievement.

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ABSTRACT

This study investigated the level of utilization of science facilities in Early childhood education (ECE) classrooms in Oredo Local Government area, Edo State. The study also sought to find out the extent to which science facilities were available in ECE classrooms in Oredo Local Government Area. The differences in the level of utilization of science facilities based on location, categories of teachers, and ownership of schools were areas of interest in this work. Five research questions were raised to guide the study. Two research questions were answered while three were formulated into hypotheses and tested at 0.05 level of significance. The study adopted the descriptive survey research design. 175 teachers formed the sample of the study. The instrument titled "The level of availability of science facilities in ECE classrooms" was a self designed checklist by the researcher to collect data for the study. Data collected were analyzed using mean, standard deviation and independent sample t-test. The following were among the findings: The majority of science facilities are highly available in Early Childhood Education (ECE) classrooms in Oredo Local Government Area, the level of utilization was at least once a month, there were no significant differences in the level of utilization of science facilities in early childhood classrooms in Oredo Local Government Area based on location, categories of teachers and ownership of schools. Based on the findings, it was recommended that the number of utilization should be increased to once a week. Science is very vital in the life of a human being and it plays a crucial role in the development and understanding of the world. Once in a month is not adequate for science experience because it may not be sufficient to foster a deep and lasting appreciation for the subject. To enhance a child's engagement in science activities, it is beneficial to increase the frequency of the utilization to at least once a week so that the child gets used to science activities.

CHAPTER ONE

INTRODUCTION

Background of the Study

Education in a broad sense is any act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense, education is the process by which society deliberately transmits its accumulated knowledge, skills and values from one generation to another (Ajitoni, 2005). It is an act of imparting or the acquisition of knowledge; mental and moral training; cultivation of the mind, feelings, and manners. Harry (1904) defines education in a broad sense, with reference to human beings as an example, comprehends all that disciplines and enlightens the understanding, corrects the temper, cultivates the taste, and forms the manners and habits. In a narrower sense, it is the special course of training pursued, as by parents or teachers, to secure anyone or all of these ends.

Early childhood education (ECE) essentially includes all official and informal educational activities. The early childhood education age ranges from birth to eight years old (0–8) when a child's brain is most receptive to their surroundings.

For a youngster to develop properly, this schooling is essential. Later years of a person's life may be profoundly influenced by it. Children need a particular educational approach during this period of "remarkable growth" to make sure they grasp the fundamental ideas and abilities they need to succeed in the future.

Science is the study of nature, habits, and information we learn about natural phenomena. The best scientific discoveries are extremely straightforward.

It is useful to explain our perspective on science before moving on to a more in-depth explanation of science for the very young. Understanding the natural world is the aim of science, which is accomplished through a procedure called scientific inquiry.

Science depends on the choice of materials and their availability. Children interact with and face the phenomenon in question through the resources. The resources should, to the greatest extent feasible, be transparent, open-ended, and chosen so that kids can concentrate on key facets of the phenomenon. This contrasts with materials that influence what youngsters think and do by their looks and ability to be altered.

Long-term and short-term good scientific research last for a considerable amount of time. Some kids could need some time to get involved, while actively involved kids might stick with something for extended periods. The regular schedule in young children's classes frequently works against inquiry-based science education. Children can begin their task but stop when it is interrupted by brief (20 or 30-minute) activities or choice times. Additionally, science needs to be discussed and documented. This also requires time. Science needs room. It could be necessary to spread out activities in the classroom and outside if you want kids to interact with phenomena in a variety of ways. The building can take place on table tops, on the

sand table, or in the block area. Plants that are developing in various ways, germination seeds, and interesting outdoor collections all need a place to go.

A shadow puppet show, a darkened alcove for flashlight games, and a lamp and screen to investigate shapes are all possible tools for shadow exploration. This requirement for time and space suggests that other priorities may need to be altered or put on hold to focus on a scientific endeavor. A science discussion might occasionally replace the morning circle ritual. The water table might only be used for washing dishes and bathing baby dolls, while the dramatic play area might be a shadow puppet theater.

According to Kellery & Psillos (2002), "Science in early childhood is of great importance for the development of children's scientific concepts as well as for many other aspects of their development." In addition, as science helps us comprehend the world better, children begin learning and applying scientific principles when they are in preschool (Charlesworth & Lind, 2010).

As a result, it is crucial to have a scientific understanding of the world around us, which develops from infancy. Children's early interactions with science at home include learning about day and night, cooking, gardening, and other everyday activities.

Playing helps children grasp the world and develops their preparation for formal learning. Parents lead the activities. This is so because the foundation of science education is made up of regular activities in preschool. One of the daily tasks in early

childhood education that is essential is science-related activities. environments. This means that children can participate in science activities without the need for any particular equipment and that different science activities can be carried out using the facilities and possibilities already in place. Science facilities are specialized structures, labs, or research facilities created to promote scientific investigation and advancement. To carry out cutting-edge scientific experiments, investigations, and analyses, these institutions are often outfitted with cutting-edge technology, specialized equipment, and highly qualified employees. Laboratories, research centers, observatories, synchrotrons, and high-performance computing facilities are a few examples.

Overall, science facilities are essential for improving scientific understanding and knowledge since they offer the opportunity for scientists to perform cutting-edge research, infrastructure, and resources are required.

In an early childhood classroom, science facilities can refer to areas or centers that are set up to promote scientific exploration and learning in young children. These facilities are designed to stimulate children's curiosity, promote their questioning skills, and encourage them to explore and experiment with the natural world around them. Some examples of science facilities that may be found in an early childhood classroom include:

Exploration table or sensory table, Discovery Center, Nature center, and Science books and resources. Science facilities in an early childhood classroom can help

promote a love of science and curiosity about the natural world in young children, and help lay the foundation for future scientific learning and exploration.

It is generally assumed that better facilities will affect the quality of education in schools, but evidence concerning this assumption is often not considered or even known.

Statement of the Problem

Lack of adequate science teaching facilities will surely affect the teaching and learning process in science subjects. There are some problems outlined below encountered in schools due to the lack of adequate facilities. It is known that the academic performance of each student depends to a large extent on the facilities exposed to them while learning, but when these facilities are lacking some problems are faced.

Since students have a low interest in science subjects, they will have a low level of understanding, because interest also plays a vital role in facilitating learning and for that reason, the knowledge delivered to the students would not be fully understood.

Laboratories are lacking in many schools and in some schools where they can be found reagents and equipment are lacking. For instance, science students who always learn in the abstract, without practical knowledge of what the teacher is saying, cannot have effective learning and this will automatically affect his/her academic performance. This lack of laboratories has resulted in low interest in science subjects.

Also, the non-availability of teaching facilities like science textbooks, buildings, scientific charts, and chalkboards has resulted in little or no interest of pupils towards science subjects which has made the teaching of science in early childhood boring to the pupils which hindered academic performance of pupils in science subjects.

Finally, it is observed that students apply their acquired knowledge ineffectively since they have not been able to be taught the practical aspects but rather expressed only theoretical aspects of their field of specialization, if they have been opportune to make use of facilities in different aspects they would have to be effectively appropriate.

Research Questions

The following research questions were raised to guide the study

1. What is the level of availability of science facilities in ECE classrooms?
2. What is the level of utilization of science facilities in ECE classrooms?
3. Is there any difference in the level of utilization of science facilities in rural and urban ECE classrooms?
4. Is there any difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms?
5. Is there any difference in the level of utilization of science facilities in ECE based on ownership of schools?

Hypotheses:

Research questions 1 and 2 were answered while research questions 3, 4, and 5 were formulated into hypotheses and tested at 0.05 level of significance.

Ho1: There is no significant difference in the level of utilization of science facilities in rural and urban ECE classrooms.

Ho2: There is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms.

Ho3: There is no significant difference in the level of utilization of science facilities in ECE classrooms based on ownership of schools.

Purpose of the Study

The purpose of the study is to find out the level of the utilization of science facilities in early childhood classrooms in Oredo Local Government Area. The specific objectives include to;

1. Find out the level of availability of science facilities in early childhood classrooms.
2. Ascertain to the level of utilization of science facilities in early childhood classrooms.
3. Find out if there is any difference in the level of utilization of science facilities in rural and urban ECE classrooms.
4. Determine if there is any difference in the level of science facilities based on the different categories of teachers in early childhood classrooms.
5. Ascertain if there is any difference in the level of utilization of science facilities in early childhood classrooms based on the ownership of schools.

Significance of the Study

This study will be significant to the following bodies: educational administrators, teachers, and ministry of Education.

This study would be useful in providing educational administrators with information on the immeasurable benefits of science facilities in nursery schools and it is also hoped that this study would help provide teachers an opportunity to use the right instructional materials in teaching science subjects for nursery school effectiveness. This study would help the Ministry of Education to know the level of utilization of science facilities available for use in schools and the need to provide more.

Scope and Delimitation of the Study

The study investigated the level of utilization of science facilities in early childhood classrooms in Oredo Local Government Area in Edo State.

The science facilities of interest in this study includes discovery tables, magnifying glasses, microscopes, balance scales, water stations, and plant growing stations. The population being studied in this research is nursery schools in Oredo, Edo state.

The study is delimited to Nursery and Kindergarten classrooms of public and private schools in Oredo Local Government Area, Edo state.

Operational Definition of Terms

The following terms are operationally defined as follows.

Utilization: Utilization refers to the act of using something or putting it into practical use. It is the process of making the most out of a resource, facility, or service to

achieve a desired outcome. Utilization can refer to the use of physical resources, such as equipment or facilities, as well as the use of human resources, such as skills and knowledge. It is the thorough or systematic process by which a facilitator or teacher develops and delivers material effectively.

Science: Science is a systematic and empirical approach to understanding the natural world through observation and experimentation. Science education is an important component of modern education systems, as it helps students develop critical thinking skills, problem-solving abilities, and a deeper understanding of the natural world. The study of science has many practical applications and benefits, from improving our understanding of the natural world to developing new technologies and innovations that benefit society.

Facilities: Facilities refer to physical or non-physical resources that are used to support specific activities or functions. In the context of education, facilities may include buildings, classrooms, laboratories, libraries, technology equipment, sports facilities, and other resources that support teaching and learning. Facilities are an essential component of the educational environment and play an important role in supporting teaching and learning, as well as the broader goals of education.

Early childhood classroom: An early childhood classroom is a learning environment designed for young children between the ages of three and five years old. The classroom is typically structured to meet the developmental needs of young children and to provide a safe, nurturing, and stimulating environment for learning

and growth. Early childhood classrooms may include a variety of learning areas and activities, such as a reading corner, a dramatic play area, a science center, and art stations. These areas are designed to provide children with opportunities for exploration, creativity, and social interaction, while also promoting the development of key cognitive, social, emotional, and physical skills.

Overall, early childhood classrooms are designed to support the unique needs of young children and to provide a positive and engaging learning environment that promotes growth and development.

Nursery School: A nursery school, also known as a preschool or playgroup, is an educational institution that provides early childhood education to children typically between the ages of three and five years old, although the age range can vary depending on the country or region. Nursery schools focus on providing a safe and nurturing environment for young children to learn, play, and socialize with other children of the same age group.

The curriculum of a nursery school usually includes basic concepts such as language development, socialization, motor skills development, pre-reading and pre-writing skills, and basic math concepts. The teaching methods used in nursery schools are often play-based, with a focus on interactive and experiential learning activities.

Nursery schools may be operated by private organizations, governments, or religious institutions. Some may be part of larger educational institutions such as elementary schools or universities, while others may be standalone facilities. The purpose of a

nursery school is to prepare children for entry into primary school and provide a foundation for their future academic and social success.

Public School: Public schools are educational institutions that are funded and operated by the government, usually at the state or local level. Public schools offer free education to all students who meet the age and residency requirements. Public schools are open to all students, regardless of their socioeconomic status, religion, or gender.

Private School: A private school is an educational institution that is privately funded and operated by a non-governmental organization, such as a corporation, religious group, or individual. Private schools typically charge tuition fees and may have admission requirements, such as entrance exams or interviews. Private schools may offer a range of educational programs, including preschool, elementary, middle, and high school education. Private schools may offer specialized programs in areas such as the arts, sports, or science, and they may have smaller class sizes and more individualized attention for students.

Pupils: Pupils are students who are enrolled in a school or educational institution and are typically between the ages of five and 18 years old. Pupils are often organized into classes or grade levels based on their age and educational level. Pupils are expected to attend school regularly, participate in classroom activities and discussions, complete assigned work, and demonstrate progress and achievement in their learning.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

This chapter reviewed related literature on the level of utilization of science facilities in early childhood classrooms. They are discussed under the following sub-headings;

- Theoretical framework.
- Definition, conceptualization and dimensions of science facilities.
- Concept of early childhood education.
- Level of availability of science facilities in early childhood classrooms.
- Level of utilization of science facilities in early childhood classrooms.
- Level of utilization of science facilities in rural and urban early childhood classrooms..
- Difference in the level of utilization of science facilities by the different categories of teachers in early childhood classrooms.
- Difference in the level of utilization of science facilities in early childhood classrooms based on ownership of schools
- Summary of reviewed literature.

Theoretical Framework

The theoretical framework provides a conceptual foundation for understanding and exploring the level of utilization of science facilities in early childhood classrooms. Several key theories and perspectives have been influential in studying this topic, shedding light on the factors that influence the effective use of science facilities in early childhood education.

Constructivism

Constructivism is a learning theory that emphasizes the active construction of knowledge by the learner through hands-on experiences and interactions with the environment. In the context of early childhood science education, constructivism suggests that children learn best when they engage in hands-on activities using science facilities. The theoretical framework of constructivism highlights the importance of providing opportunities for young children to explore and interact with the materials and equipment in science facilities, fostering their curiosity, critical thinking, and problem-solving skills.

Socio-cultural Theory

Socio-cultural theory, developed by Lev Vygotsky, emphasizes the role of social interaction and cultural context in cognitive development. According to this perspective, learning is a collaborative process that occurs through interactions with more knowledgeable others. In the context of science facilities in early childhood classrooms, socio-cultural theory underscores the significance of social interactions

between children and teachers or peers. Collaborative exploration of science materials can enhance children's understanding of scientific concepts, promote language development, and encourage higher-level thinking skills.

Experiential Learning

Experiential learning theory, proposed by David Kolb, emphasizes the importance of concrete experiences in the learning process. This theory suggests that learning occurs through a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation. When applied to early childhood science education, experiential learning theory suggests that children learn best when they actively engage in hands-on experiences with science facilities, reflect on their observations, make connections to prior knowledge, and apply their understanding in new situations.

Ecological Systems Theory

Ecological Systems Theory, developed by Urie Bronfenbrenner, highlights the influence of the environment on children's development. This theory views development as a complex interplay between various systems, including the microsystem (immediate environment), mesosystem (connections between microsystems), exosystem (indirect influences), and macrosystem (cultural values and beliefs). In the context of science facilities in early childhood classrooms, ecological systems theory emphasizes the importance of creating an environment

that supports children's engagement with science materials and provides opportunities for exploration and discovery.

Universal Design for Learning (UDL)

Universal Design for Learning is an educational framework that promotes inclusive learning environments by providing multiple means of engagement, representation, and action/expression. When applied to early childhood science education, UDL suggests that science facilities should be designed to accommodate diverse learning styles, abilities, and interests. By incorporating a variety of materials, technologies, and instructional strategies, educators can create inclusive science learning experiences that allow all children to participate and succeed.

Definition, Conceptualization, Dimensions Of Science Facilities

In a world immersed in the fruits of scientific exploration, scientific literacy stands as an imperative for all. It is essential for each individual to employ scientific knowledge in their daily decision-making, participate thoughtfully in public discourse, and engage in debates concerning vital issues entangled with science and technology. Moreover, everyone should have the opportunity to partake in the exhilaration and personal enrichment that arises from comprehending and learning about the natural world (National Research Council, 1996, p. 1).

The rationale behind prioritizing science within early childhood education derives from numerous factors that presently influence the early childhood community. Foremost among these factors is the burgeoning recognition of the potency inherent

in early childhood cognition and learning. Research and practice demonstrate that children possess a far greater capacity for learning than previously believed. Therefore, early childhood settings must offer more enriching and stimulating environments for learning, guided by proficient educators. Such environments in the early years can wield significant influence over a child's future learning. Science, in particular, emerges as a pivotal domain during early childhood, not only establishing the foundation for future scientific comprehension but also fostering essential skills and attitudes for lifelong learning. This perspective finds support in a recent publication by the National Research Council:

Children who possess a broad foundation of domain-specific knowledge, whether in mathematics or a branch of science, advance more swiftly in acquiring advanced skills. Mathematics and science are considered "privileged domains," wherein children naturally incline toward learning, experimenting, and exploring, thus nurturing and expanding the boundaries of their existing knowledge. This becomes especially crucial during the preschool years when the faculties of attention and self-regulation are in their nascent stages (Bowman, Donovan, & Burns, 2001, pp. 8-9).

As varied as the scientific disciplines themselves, the definitions of science can vary among scientists. The most effective approach to delineate science involves considering its diverse facets. According to the Oxford Advanced Learner's Dictionary, science is the exploration of the structures and behaviors of the physical and natural world, as well as its intersection with society, principally through

observation and experimentation. Ogunniyi (1986) illuminates the diversity in scientists' interpretations of science, ranging from viewing it as an organized body of knowledge to considering it a quest for the meanings and explanations underlying natural phenomena. Science can also be construed in terms of its methodologies and processes, the activities of scientists, its products manifested as knowledge in the form of facts, concepts, laws, and theories, or through the lens of its ethical underpinnings and underlying motives.

Ogunniyi (1986) characterizes science as a human endeavor to structure their experiences with the natural world into coherent systems of explanation. These experiences encompass the discovery of regularities or anomalies in nature, comprehending the ramifications of human interventions on elements, events, or situations in nature, and deriving understanding through the manipulation of various natural phenomena. Science stands as a dynamic human pursuit, devoted to unraveling the inner workings of our world. This comprehension equips scientists to delve deeper into the intricacies of phenomena and to harness them for the betterment of humanity.

It is vital to discern that science primarily pertains to understanding and exploring the natural world, distinct from the realm of manufactured goods such as automobiles, trucks, or airplanes. The origins of scientific inquiry can be traced back to early humanity, whose interactions with nature yielded insights into plant growth, the edibility of various plant species, and the fundamental reasons behind diurnal and

nocturnal cycles, among other discoveries. Throughout history, humankind has been preoccupied with studying and deciphering the universe and the events it encompasses.

Schools are established with the fundamental purpose of facilitating teaching and learning, requiring the allocation of both human and material resources. Science facilities encompass the material resources furnished for the optimization of the productivity of both staff and students in the teaching and learning processes. Acknowledging that knowledge transmission extends beyond the confines of the classroom, involving discovery, exploration, and interaction with the internal and external environments, has necessitated innovative developments in teaching and learning facilities that adapt to these evolving paradigms. Schools, serving the socioeconomic and political needs of a continually changing society, maintain ongoing interactions with their external milieu. They receive inputs in the form of human and material resources, process them, and channel them into society as finished products and services. The caliber of these products bears a direct correlation to the quality of the facilities harnessed throughout the production process.

Consequently, the imperative arises for schools to provide state-of-the-art facilities, preparing students to thrive in the global milieu. According to Propst (1972), planners and management teams should consider a diverse array of valuable resources, encompassing acoustical design engineering, audiovisual design

engineering, behavioral sciences, building systems design, community and press relations, ecological studies, electronic data processing for hardware specifications, electronic data processing for program development, utilization of facility training, and financial planning. Other vital components involve food service planning, graphic design, healthcare planning, information management, installation supervision, interior design, laboratory planning and engineering, lighting design, management consulting, project planning, safety engineering, site planning, technical equipment specialization, and urban planning.

This underscores that the provisioning of facilities represents a collective responsibility, involving federal, state, and local government authorities, school staff, students, and the surrounding community. The Federal Government, through the Federal Ministry of Education, establishes policies guiding the educational system and supervises their implementation at the state level. Conversely, State Governments ensure the practical enactment of the National Policy on Education by fostering an environment conducive to effective teaching and learning.

Furthermore, established organizations like the National Science Teachers Association (NSTA, 1997) and the National Association for the Education of Young Children (NAEYC, 2000) have consistently championed the creation of vibrant and stimulating science environments within early childhood education (ECE) classrooms.

Lastly, science facilities are recognized as pivotal resources for teaching science and serve as significant predictors of academic achievement. However, their efficacy hinges on their efficient utilization by both educators and students. Mere availability of science facilities does not guarantee improved performance; it is the judicious and effective use of these resources within the school setting that truly matters. Consequently, when science facilities are provided to schools, three potential scenarios emerge: they remain unused, are used inefficiently, or are employed efficiently (Lewin 2000).

Concepts of Early Childhood Education

The period of early childhood is until the age of eight years. One of the reasons that early childhood is regarded up to the age of eight is to enable him or her to acquire a smooth understanding of the entire education from the level of play group to pre-primary and from pre-primary to the level of primary. Early childhood education is in an organized form to a major extent. The teachers and the other members of the pre-school, who are involved in this education are required to be systematic and methodical in their workings and conduct. It requires efficiency in its format and implication. Within this framework, the term 'care' holds much significance. When imparting any kind of learning, understanding or information to the students, the teachers need to take into consideration the aspects of care and thoughtfulness.

In pre-schools, students are young, hence, they need to be taken care of in terms of various aspects, such as, learning, playing, health, emotions, diet, nutrition, and psychoanalysis. These are important for the overall development of the child.

Early childhood education has its roots in several historical milestones, including the emergence of kindergarten by Friedrich Froebel in the 19th century and the establishment of the Head Start program in the United States during the 1960s. These initiatives emphasized the significance of providing stimulating and nurturing environments for young children to enhance their learning and development. The historical context highlights the gradual recognition of the importance of early childhood education as a vital component of educational systems worldwide.

Early childhood education has a profound impact on children's cognitive, social, and emotional development. Cognitive development encompasses language acquisition, problem-solving abilities, and early literacy and numeracy skills. Social development involves the cultivation of social skills, cooperation, empathy, and the ability to form positive relationships. Emotional development focuses on self-regulation, emotional intelligence, and resilience.

Early childhood education comprises several essential components that contribute to children's holistic development. These components include a child-centered and play-based approach, a stimulating and inclusive learning environment, a well-designed curriculum, and the involvement of educators, parents, and the broader

community. By addressing these components, early childhood education programs aim to promote children's cognitive, social, emotional, and physical growth.

The main purpose of early childhood education is to lead to effectual growth and development of the students. It creates the foundation for learning among the students, so that they are able to develop their skills and abilities efficiently from the early age. Early childhood care and education also makes provision of information and knowledge to the families and communities of the students, with the purpose of contributing towards their effective growth and development. In pre-schools, learning begins with play, when students begin to take pleasure in play activities, then at the next level, they are taught drawing and coloring strategies, which enables them to develop an interest in art. At the next level, students are taught academic concepts, such as alphabets, numbers etc. Education is a comprehensive area. It covers skills, knowledge, attitudes, habits, communication, cognitive skills, intellectual abilities, wisdom, astuteness, righteousness and honesty. These factors are essential for the development of the mind-set of the students and it also contributes towards their progression. The students have to be well prepared to enter the education system at the formal level. In order to seek admission in formal schools, it is vital for the students to possess adequate understanding of academic concepts, so that they can appropriately cope up with the teaching-learning methods provided to them by the teachers and enhance their performance.

Level of availability of science facilities in early childhood classrooms

The availability of science facilities in early childhood classrooms is a critical factor that significantly impacts the quality and effectiveness of science education experiences for young learners. Science facilities refer to the resources, materials, tools, and equipment that enable hands-on exploration and inquiry-based learning in science. The level of availability of science facilities directly influences children's engagement, curiosity, and understanding of scientific concepts.

Understanding whether science facilities are available in every early childhood classroom is essential for assessing the extent to which young learners have access to hands-on science experiences and inquiry-based learning. This literature review examines the existing research and literature on the availability of science facilities in early childhood classrooms, highlighting factors that influence availability, disparities across different settings, and potential strategies for enhancing access.

1. Factors Affecting Availability: Numerous factors influence the availability of science facilities in early childhood classrooms. These factors include educational policies, funding, infrastructure, teacher training, and community support. Studies by Jones et al. (2018) and Morrison and Younger (2019) highlight the impact of funding constraints on the availability of science facilities. Limited financial resources may restrict the purchase of science materials, equipment, and the creation of dedicated science centers.

Infrastructure constraints can also affect availability, as discussed by Sackes et al. (2017). Limited physical space in classrooms can hinder the establishment of science centers or the storage of science materials. Furthermore, the availability of science facilities may be influenced by the emphasis placed on science education in educational policies and curriculum guidelines (Stipek et al., 2017).

2. Disparities in Availability: Research suggests that there are disparities in the availability of science facilities across different early childhood classroom settings. Urban classrooms often have better access to science facilities due to factors such as funding, proximity to scientific institutions, and collaborations with community organizations (Diamond et al., 2016). In contrast, rural or economically disadvantaged areas may face challenges due to limited resources, infrastructure, and geographic barriers (Stark et al., 2018).

   Disparities may also exist within urban areas, as highlighted by Abrams and Rutledge (2019). Schools in low-income neighborhoods may have less access to science facilities compared to schools in more affluent areas. These disparities can contribute to unequal opportunities for science learning in early childhood classrooms.

   Level of availability of science facilities in early childhood classrooms varies depending on various factors, including the educational context, funding, resources, and support systems in place. While efforts have been made to enhance the

availability of science facilities, there are still challenges that limit their widespread availability.

3. Educational Context and Policy: The availability of science facilities in early childhood classrooms can be influenced by educational policies and guidelines at the local, regional, or national levels. Some educational systems prioritize science education and allocate resources specifically for science facilities, while others may have limited emphasis on early science education.
4. Funding and Resources: Access to adequate funding plays a significant role in determining the availability of science facilities. Schools or early childhood programs with sufficient financial resources can invest in well-equipped science centers, materials, tools, and technology. However, budget constraints may limit the availability of science facilities, particularly in under-resourced or economically disadvantaged areas.
5. Infrastructure and Physical Space: The physical infrastructure of early childhood classrooms can impact the availability of science facilities. Schools with dedicated science rooms or science centers are more likely to have well-equipped facilities compared to classrooms with limited space. Adequate storage, display areas, and workstations are essential for organizing and maintaining science materials and resources.
6. Teacher Knowledge and Support: The availability of science facilities is closely linked to the knowledge, skills, and support provided to early childhood educators.

Teachers who have received professional development in science education are more likely to utilize science facilities effectively. Adequate support systems, including access to curriculum resources, mentoring, and collaboration with other educators, can enhance the utilization of science facilities.

7. Community and Parental Involvement: Community support and parental involvement can also influence the availability of science facilities in early childhood classrooms. In some cases, community partnerships or grants may provide additional resources and funding for science facilities. Parental engagement in science-related activities and volunteering can contribute to the availability of materials and support the integration of science in early childhood programs.

Level of utilization of science facilities in early childhood classrooms

The utilization of science facilities in early childhood classrooms is crucial for fostering scientific exploration, inquiry-based learning, and the development of critical thinking skills in young learners. Understanding the extent to which science facilities are well utilized in every early childhood classroom is essential for evaluating the effectiveness of science education practices. This literature review aims to examine existing research and literature on the utilization of science facilities in early childhood classrooms, exploring factors that influence utilization, variations across different settings, and strategies for enhancing effective utilization. The extent to which science facilities are well utilized in early childhood classrooms can vary across different educational settings and contexts. While many early childhood

classrooms strive to effectively utilize science facilities, there are several factors that influence the level of utilization.

Science facilities play a crucial role in early childhood classrooms by providing young learners with hands-on experiences, promoting curiosity, inquiry, and critical thinking skills. These facilities encompass resources, materials, tools, and equipment that support scientific exploration and inquiry-based learning. The effective utilization of science facilities enhances the learning experience and fosters a love for science in early childhood education.

- Teacher Knowledge and Training: The knowledge and training of early childhood educators in science education play a significant role in the utilization of science facilities. Teachers who have received professional development and have a strong understanding of inquiry-based teaching strategies are more likely to effectively utilize science facilities (Dunn & Kontos, 1997; Gilmer & Atwater, 2018).

- Availability of Resources: The availability and accessibility of science resources, including materials, equipment, and technology, impact the utilization of science facilities. Well-equipped science facilities with a variety of resources facilitate hands-on experiences, inquiry-based learning, and experimentation (Diamond et al., 2017; Fleer, 2014). Limited resources can hinder the utilization of science facilities and restrict the range of experiences offered to young learners.
- Integration with the Curriculum: The integration of science into the early childhood curriculum is crucial for effective utilization of science facilities. When science is

seamlessly integrated across subject areas, it becomes an integral part of the daily learning experiences, enhancing the utilization of science facilities (National Research Council, 2015). Incorporating science concepts into various domains, such as language arts and mathematics, promotes interdisciplinary learning and strengthens the utilization of science facilities.

- Classroom Practices and Pedagogy: The pedagogical approaches employed by early childhood educators also impact the utilization of science facilities. Inquiry-based teaching, hands-on experiences, and open-ended questioning techniques are effective strategies that encourage active engagement, critical thinking, and utilization of science facilities (Aram et al., 2014). Creating a learning environment that fosters exploration, experimentation, and collaborative problem-solving enhances the utilization of science facilities.
- Supportive Environment and Collaboration: A supportive school environment and collaboration among educators, administrators, and the community can enhance the utilization of science facilities. Ongoing support, mentoring, and collaboration among educators facilitate the sharing of ideas, resources, and best practices (Duschl et al., 2007). Community partnerships with scientific institutions, universities, and local experts can provide additional support, access to resources, and real-world applications of science concepts (Diamond et al., 2016).

This comprehensive overview explores key points on how science facilities are being utilized in early childhood classrooms, encompassing hands-on experiences,

integration with the curriculum, teacher training and support, collaboration and social interaction, and their impact on children's learning outcomes.

- Hands-On Experiences: Hands-on experiences are at the core of utilizing science facilities in early childhood classrooms. These experiences involve direct interaction with materials, objects, and tools, allowing children to explore, manipulate, and experiment with scientific concepts. Hands-on experiences promote active engagement, curiosity, and deep understanding of scientific phenomena (Dunn & Kontos, 1997). Examples of hands-on experiences in science facilities include observing plants grow from seeds, conducting experiments with magnets, investigating properties of water through water play, and exploring animal habitats through models or sensory materials. Hands-on experiences stimulate sensory exploration, fine motor skills development, and the application of scientific inquiry skills (NGSS Lead States, 2013).
- Integration with the Curriculum: Effective utilization of science facilities involves integration with the early childhood curriculum, ensuring that science concepts are woven seamlessly into the overall learning experience. By integrating science across other subject areas, children can make connections between science and their daily lives, fostering a holistic understanding of the world (National Research Council, 2015).

For instance, a unit on plants can involve hands-on experiences in the science facility, such as planting seeds, observing plant growth, and exploring the life cycle of a plant. These experiences can be integrated with language arts by reading books about

plants, mathematics by measuring plant growth, and social studies by exploring plants in different regions or cultures.

Integration with the curriculum provides opportunities for cross-disciplinary learning, reinforcing and extending children's understanding of scientific concepts while fostering connections across multiple domains of learning (Diamond et al., 2017).

- Teacher Training and Support: Utilizing science facilities effectively in early childhood classrooms requires well-trained and supported educators. Teachers need the knowledge, skills, and confidence to facilitate hands-on experiences, ask open-ended questions, and guide children's inquiry-based learning. Professional development opportunities and ongoing support are crucial for teachers to utilize science facilities effectively. Workshops, seminars, coaching, and collaborative planning sessions enhance teachers' pedagogical content knowledge in science and provide them with strategies for incorporating hands-on experiences and inquiry-based approaches (Ginsburg et al., 2016).

  Access to resources such as science curriculum guides, assessment tools, and mentoring programs contribute to teachers' professional growth and support their implementation of science activities (Duschl et al., 2007).

- Collaboration and Social Interaction: Utilization of science facilities in early childhood classrooms fosters collaboration and social interaction among children. Collaborative learning experiences promote teamwork, communication skills, and the ability to share ideas and perspectives. Science activities that require group work

enable children to learn from one another, engage in peer discussions, and develop problem-solving skills (Vygotsky, 1978).

Collaborative experiences can involve working together on experiments, investigations, or projects in the science facility. Through collaboration, children learn to negotiate ideas, build on each other's knowledge, and develop social skills such as empathy, respect, and cooperation (Aram & Galperin, 2014).

Social interaction during science facility experiences enhances language development, scientific vocabulary, and reasoning skills among children (Dindar & Geban, 2016). Collaboration and social interaction contribute to a positive classroom climate, promote inclusive learning environments, and support children's holistic development.

- Impact on Children's Learning Outcomes: Utilizing science facilities effectively in early childhood classrooms positively impacts children's learning outcomes and development. Engaging in hands-on science experiences promotes cognitive development, critical thinking skills, and a deep understanding of scientific concepts (National Research Council, 2007).

  Studies have shown that early exposure to science concepts and the opportunity to explore scientific phenomena contribute to the development of a strong foundation in science and may influence career aspirations in STEM fields (Maltese & Tai, 2010).

  Hands-on science experiences in early childhood classrooms have been found to enhance children's engagement, motivation, and attitudes towards science (Diamond

et al., 2017; Dunn & Kontos, 1997). These experiences foster positive attitudes towards learning, promote curiosity, and support children's cognitive and socio-emotional development (Eshach & Fried, 2005)

Level of utilization of science facilities in rural and Urban Early Childhood Classrooms

The level of utilization of science facilities in early childhood education (ECE) classrooms varies between rural and urban settings worldwide. Factors such as access to resources, teacher training, infrastructure, and community support influence the extent to which science facilities are utilized in both rural and urban ECE classrooms. This comprehensive overview examines the level of utilization of science facilities in rural and urban ECE classrooms, highlighting key differences and similarities between both areas.

The level of science facilities in urban early childhood education (ECE) classrooms can vary depending on factors such as funding, availability of resources, teacher knowledge, curriculum integration, and community support. Urban ECE classrooms generally have better access to funding, infrastructure, and partnerships with scientific institutions, which can contribute to the availability of well-equipped science facilities. These facilities may include dedicated spaces, science materials, tools, equipment, and technology. However, disparities may exist within urban areas, with schools in low-income neighborhoods potentially having limited access to science facilities. The level of science facilities is also influenced by teacher

knowledge and training in science education, as well as the integration of science into the curriculum and classroom practices. Effective utilization of science facilities requires seamless integration across subject areas and the implementation of inquiry-based teaching strategies. Additionally, community partnerships and parental involvement can enhance the level of science facilities by providing additional resources, funding, and real-world applications of science concepts.

The level of science facilities in rural early childhood education (ECE) classrooms may face unique challenges due to factors such as limited financial resources, geographic barriers, and infrastructure constraints. Unlike their urban counterparts, rural ECE classrooms often have limited access to funding and resources, which can affect the availability and level of science facilities. These facilities may include dedicated science centers, science materials, equipment, and technology. Geographic barriers, such as remote locations or limited transportation options, can further impede access to specialized resources and partnerships with scientific institutions. Additionally, infrastructure constraints and limited physical space in rural classrooms can hinder the establishment of science centers or the storage of science materials. However, despite these challenges, rural ECE teachers often demonstrate creativity and resourcefulness in utilizing science facilities. They may rely on low-cost, locally available materials and leverage the natural environment to provide hands-on science experiences for their students. Community engagement and involvement can also play a crucial role in supporting the level of science facilities in

rural ECE classrooms by providing resources, expertise, and opportunities for field trips or guest speakers.

Level of Utilization in Rural ECE Classrooms:

- Limited Access to Resources: Rural ECE classrooms often face challenges in accessing science facilities and materials due to limited financial resources, geographical barriers, and infrastructure constraints. These limitations may restrict the availability of science resources, hands-on materials, and technological tools.
- Teacher Training and Professional Development: Rural areas may face difficulties in providing adequate teacher training and professional development opportunities in science education. Limited access to specialized training programs and professional networks may hinder teachers' ability to effectively utilize science facilities in the classroom.
- Community Engagement and Support: Rural communities often have unique characteristics and limited access to external scientific institutions or partnerships. However, community engagement and involvement can play a vital role in supporting the utilization of science facilities in ECE classrooms. Collaboration with local experts, community members, and parents can provide resources, expertise, and opportunities for field trips or guest speakers.
- Creativity and Resourcefulness: Despite resource limitations, rural ECE teachers often demonstrate creativity and resourcefulness in utilizing science facilities. They may rely on low-cost, locally available materials and incorporate nature-based

experiences to engage children in hands-on science activities. Leveraging the natural environment and local community resources can foster curiosity and provide authentic learning opportunities.

Level of Utilization in Urban ECE Classrooms:

- Access to Resources: Urban ECE classrooms typically have better access to science facilities, materials, and technological resources due to the availability of funding, infrastructure, and proximity to scientific institutions. Well-equipped science centers, museums, and libraries may offer urban ECE classrooms additional resources and learning opportunities.
- Teacher Training and Professional Development: Urban areas often provide greater access to professional development opportunities, specialized training, and collaboration with other educators. Teachers in urban ECE classrooms may have more exposure to the latest research and teaching strategies, enabling them to effectively utilize science facilities and implement inquiry-based approaches.
- Community Partnerships and Engagement: Urban ECE classrooms have greater opportunities for collaboration with local scientific institutions, universities, and community organizations. These partnerships can provide access to expert knowledge, guest speakers, field trips, and hands-on experiences, enriching the science education experience for children.
- Diversity and Cultural Relevance: Urban ECE classrooms often exhibit greater diversity in terms of culture, language, and backgrounds. Utilizing science facilities

in an urban context requires incorporating culturally relevant and inclusive practices. Recognizing and valuing the diverse perspectives and experiences of urban communities can enhance the level of utilization of science facilities and promote equitable access to science education.

Difference in the level of utilization of science facilities by the different categories of teachers in early childhood classrooms

Science facilities in educational institutions are essential for effective science education. Teachers' utilization of these facilities can vary based on their categories or roles. Science teachers can have a major influence on the way science students learn and develop. Science teachers who have an impact on students' lives are those who have a genuine interest in students, know their subject matter and possess detailed information about instructional processes and the way students learn and develop. Among all other teachers' tasks in curriculum implementation is teaching which is intended to stimulate learning (Emeruwa, 1985). The teachers' guidance of students in the process of teaching takes many forms with equally many kinds of learning outcomes. Early childhood education encompasses a crucial stage in a child's development, typically spanning from birth to around eight years of age. During this period, various categories of teachers and educators play distinct roles in nurturing young minds and fostering holistic growth. These educators contribute to the cognitive, social, emotional, and physical development of children in unique ways. There are various categories of teachers in ECE; they include; preschool teachers, kindergarten teachers, early childhood educators, special education teachers,

childcare providers, Montessori teachers, Reggio Emilia teachers, bilingual or language immersion teachers, head start teachers, and early intervention specialists. Preschool teachers play a vital role in introducing young children to the world of science through well-thought-out activities that align with early childhood education standards (NAEYC) (Bowman et al., 2001). They create an engaging and accessible environment for science exploration by setting up well-equipped science centers filled with materials like magnifying glasses, plants, and age-appropriate scientific tools (Koralek et al., 2010). These teachers utilize science facilities such as sensory or water tables to engage children in hands-on experiments, encouraging basic scientific inquiry skills like color mixing and temperature observation (Worth, 2008). They also take children outdoors to explore nature, fostering a connection with the natural world (Kellert, 2005). In their classrooms, preschool teachers encourage children to make observations and document their findings through drawings, journals, or photographs, nurturing informal scientific thinking (Pizzolongo et al., 2008). By asking open-ended questions and promoting inquiry-based learning, they instill the habit of curiosity and problem-solving (Kilburn & Hancock, 2005). Moreover, they integrate storybooks and literature about science concepts into the curriculum to enhance understanding and promote language development (Lambert et al., 2011). In doing so, preschool teachers serve as catalysts, sparking children's interest in science and creating an environment where young learners can explore, question, and discover, setting the stage for a lifelong love of science. Preschool

teachers often have a more holistic focus on early childhood development, including social, emotional, and cognitive domains. They may use science facilities to a lesser extent compared to kindergarten or elementary school teachers, emphasizing play-based learning over structured science activities.

Kindergarten teachers typically incorporate science into their curriculum more prominently than preschool teachers. They often utilize science centers and hands-on materials to introduce young learners to basic scientific concepts.

Special education teachers may adapt science facilities and materials to accommodate the unique needs of students with disabilities. They focus on creating inclusive and accessible science experiences.

Montessori and progressive educators prioritize hands-on learning, including scientific exploration, from an early age. They actively use science facilities and materials to support child-led, inquiry-based learning.

Bilingual or language immersion teachers may incorporate science education in both languages, emphasizing language development alongside scientific concepts. They use science facilities to facilitate language acquisition through scientific exploration.

Head Start teachers, often working with low-income families, use science facilities as a part of a comprehensive early childhood education program. They may focus on fostering school readiness through science experiences.

Early intervention specialists adapt science facilities to address the specific developmental needs of infants and toddlers with disabilities. They emphasize early stimulation and sensory experiences.

Childcare providers may vary in their use of science facilities, with some emphasizing play-based learning and others incorporating structured science activities. Availability of resources and curriculum may differ widely. Educators following the Reggio Emilia approach often place a strong emphasis on using the environment as the "third teacher" and utilize science facilities to encourage child-led projects and exploration.

Therefore, some teachers may place a strong emphasis on hands-on science experiences, while others may prioritize broader developmental goals or adapt facilities to meet specific educational needs.

Difference in the level of utilization of science facilities in early childhood classrooms based on ownership of schools

The level of utilization of science facilities in early childhood classrooms can vary based on the ownership of schools, which includes public, private, and various alternative models.

Public schools: Public schools utilize science facilities in early childhood classrooms with a focus on providing comprehensive and developmentally appropriate science education. Public schools align their science curriculum with state or national standards. This alignment ensures that science facilities are used to teach age-appropriate scientific concepts. Early childhood science education in public schools

often emphasizes basic scientific principles, hands-on exploration, and inquiry-based learning. Public schools have access to government funding, which can support well-equipped science facilities. These facilities may include dedicated science labs, classrooms with science-related materials, and age-appropriate equipment. Resources are allocated to create engaging science learning environments that cater to the developmental needs of young children. Public school teachers undergo training and professional development in science education. This training equips them with the skills and knowledge to effectively use science facilities. Teachers are trained to implement inquiry-based teaching methods, hands-on experiments, and activities that align with the curriculum. Public schools often integrate science education with other subjects, fostering connections between science and literacy, mathematics, and social studies. This interdisciplinary approach allows teachers to utilize science facilities to teach broader concepts and skills. Public school kindergarten teachers promote inquiry-based learning by encouraging children to ask questions and explore scientific phenomena. They facilitate open-ended discussions and investigations. Science facilities are used to support this inquiry-based approach, providing materials for experimentation and exploration. Public schools serve diverse student populations, including students with special needs and English language learners. Science facilities are often designed to accommodate this diversity. Facilities may include adaptive equipment and resources to ensure inclusive science education for all children. Public school kindergarten teachers assess children's scientific

understanding through observations, discussions, and simple assessments. They use this data to adapt their teaching strategies and further utilize science facilities effectively. Public schools often engage with the local community and partner with science organizations, museums, and experts. These partnerships can enhance the utilization of science facilities by providing additional resources and opportunities for hands-on learning. Public schools are committed to continuous improvement in science education. They may regularly update science facilities, curricula, and teaching methods to align with evolving educational standards and best practices.

In summary, public schools utilize science facilities in early childhood classrooms to provide a well-rounded and developmentally appropriate science education. They prioritize alignment with curriculum standards, teacher training, and inclusive practices to foster scientific curiosity and foundational knowledge in young children.

Private school: Private schools often have a degree of flexibility in how they utilize science facilities in early childhood classrooms. The specific practices can vary depending on the school's philosophy, resources, and educational goals. Private schools can allocate resources to create well-equipped science facilities. These facilities may include science labs, dedicated classrooms, or even outdoor learning spaces. Private schools often have the flexibility to integrate science seamlessly into their curriculum. Science education becomes an integral part of the daily routine. Private schools, especially those following progressive or Montessori philosophies, emphasize hands-on learning. They provide a wide array of age-appropriate science

materials, tools, and equipments. Private schools may organize science experiments, projects, and field trips that align with the developmental stage of early childhood. These activities encourage exploration and curiosity. Smaller class sizes in private schools allow for more personalized attention and hands-on engagement in science activities. Teachers can work closely with individual students to facilitate learning. Some private schools may offer specialized science programs or STEM (Science, Technology, Engineering, and Mathematics) education. These programs often utilize dedicated science facilities and equipments. Private schools, especially those with spacious campuses, may have outdoor science learning spaces like gardens or nature trails. These spaces offer opportunities for children to explore the natural world. Private schools may integrate science concepts into thematic units or interdisciplinary projects. This approach allows children to connect science with other subjects and real-life experiences. Private school teachers often receive professional development and training in science education. This training enhances their ability to use science facilities effectively and deliver high-quality science instruction. Private schools often involve parents in science education initiatives. They may encourage parents to participate in science-related activities, further extending science learning beyond the classroom. Private schools may employ assessments and individualized learning plans to track each child's progress in science. This allows for tailored instruction and supports. Some private schools establish partnerships with local scientific institutions, museums, or organizations to

enhance science education. These partnerships can lead to field trips and guest presentations.

In summary, private schools have the autonomy to create specialized science education experiences for early childhood students. Their utilization of science facilities often emphasizes hands-on learning, personalized instruction, and integration with other subjects, fostering a strong foundation in science from an early age. However, it's important to note that the specific practices can vary significantly among private schools, depending on their unique educational philosophies and priorities.

Charter schools: Charter schools vary in their approaches to science education. Some may prioritize science and STEM education, while others may focus on different academic areas. Resource Allocation: The utilization of science facilities in charter schools depends on their mission, funding, and priorities. Some may invest heavily in science, while others may allocate fewer resources.

Montessori and Progressive Schools: Hands-On Learning: These schools often emphasize hands-on and experiential learning, including in science. They may have specialized materials and science facilities aligned with their philosophies. Child-Centered Approach: Montessori and progressive schools prioritize child-led exploration, which influences how science facilities are used.

Religious or Parochial Schools: Integration with Religious Teachings: Science education in religious schools may be integrated with religious teachings, affecting

the use of science facilities. Resource Allocation: The level of science facility utilization can vary depending on the school's resources and priorities.

To give an overview, the ownership of schools significantly influences the utilization of science facilities in early childhood education. Public schools often benefit from consistent funding and curriculum standards, while private and alternative models vary widely in their resources and approaches to science education. Regional and community factors further contribute to disparities in science facility utilization.

Summary of Reviewed Literatures.

Early childhood education up to the age of eight is important for a smooth transition and the holistic development of young students. The systematic and methodical approach in early childhood education considers various aspects of care and thoughtfulness, including learning, play, health, emotions, diet, and psychoanalysis. Historical milestones and the significance of stimulating and nurturing environments are recognized.

Science education in early childhood classrooms is crucial for fostering curiosity, critical thinking, and a deep understanding of the natural world. Six reasons are highlighted for exposing even small children to science, emphasizing their innate enjoyment of nature, positive attitudes towards science, better understanding of scientific concepts, development of scientific language and reasoning abilities, and fostering scientific thinking.

The theoretical framework for understanding the utilization of science facilities in early childhood classrooms draws upon constructivism, socio-cultural theory, experiential learning theory, ecological systems theory, and universal design for learning. These theories provide a foundation for exploring and enhancing the utilization of science facilities in early childhood education.

Scientific literacy is emphasized as essential in today's world, with the early childhood classroom playing a vital role in developing curiosity, critical thinking, and foundational skills for scientific understanding. The definition of science encompasses the study of the natural world, and its importance in understanding and improving life is highlighted.

The provision of state-of-the-art facilities in schools is crucial for preparing students for the demands of a changing society. The responsibility for providing facilities lies with various authorities and stakeholders. Science facilities are predictors of academic achievement, but their availability alone does not guarantee success. Efficient utilization of these facilities by both teachers and students is essential.

The availability of science facilities in early childhood classrooms is critical for enhancing the quality of science education experiences. Factors such as educational policies, funding, infrastructure, teacher training, and community support influence availability. Disparities exist across different settings, with urban classrooms having better access.

The utilization of science facilities in early childhood classrooms is crucial for scientific exploration, inquiry-based learning, and critical thinking development. Factors such as teacher knowledge and training, availability of resources, curriculum integration, pedagogy, and collaboration impact utilization. Effective utilization positively impacts children's learning outcomes, including cognitive development, critical thinking skills, motivation, attitudes towards science, and socio-emotional development.

The level of utilization of science facilities varies between rural and urban early childhood education classrooms. Urban classrooms generally have better access to funding and resources, while rural classrooms face challenges such as limited resources and infrastructure constraints. Despite challenges, rural teachers demonstrate resourcefulness. Community support and parental involvement play a crucial role in enhancing science facility utilization in both rural and urban settings.

This literature review explores the theoretical framework, importance, provision, and utilization of science facilities in early childhood education classrooms. It emphasizes the role of theories such as constructivism and socio-cultural theory in understanding utilization. Science education in early childhood develops essential skills, and schools play a vital role in providing well-utilized facilities. Factors like funding, infrastructure, and teacher training influence availability. Disparities exist between rural and urban classrooms, but resourcefulness and community involvement can enhance utilization. Effective utilization of science facilities fosters

scientific exploration and critical thinking, positively impacting cognitive and socio-emotional development in children.

CHAPTER THREE

METHODOLOGY

This chapter is concerned with the description of the research design and the various data collection and analysis techniques that were employed to carry out the study under the following sub headings:

- Research Design.
- Population of the Study.
- Sample and Sampling Techniques.
- Research Instrument.
- Validity of the Instrument.
- Reliability of the Instrument.
- Method of Data Collection.
- Method of Data Analysis.

Research Design

This study adopted a descriptive survey research design. This is so because a sample of the population was used for the study. It is expected that the sample is a true representation of the population to examine the level of utilization of science facilities in early childhood classrooms in Oredo Local Government Area of Edo State.

Population of the Study

The population of this study comprised all the teachers in public and private nursery and kindergarten schools in Oredo's local government area.

Sample and Sampling Techniques

35 schools formed the sample of the study. They were selected through the convenience sampling technique.

Research Instrument

The instrument for data collection was a self-designed checklist titled “The level of utilization science facilities in ECE classrooms”. It is made up of two sections. Section A elicited information on demographic data of the school including teachers qualification, the ownership of the school, class of the pupils and number of pupils in each class while section B sought to find out the level of utilization of the available science facilities present in the schools.

Validity of the Instrument

To determine the face and content validity of the instrument, the specimen of the draft copy of the checklist was given to the supervisor and another Lecturer that is an expert in Measurement and Evaluation. They effected necessary corrections and suggestions. The final instrument was constructed with compliance to their advice.

Reliability of the Instrument

The instrument is a checklist and so does not require a realizability test.

Administration of the Instrument

The researcher personally visited the schools and administered the checklists. The checklists were administered to the teachers in the selected preschools after obtaining permission from the Head teachers of each school. The checklists were collected on a later date as agreed by the researcher and the teachers.

Method of Data Analysis

In analyzing the data collected from the school, the researcher employed the use of mean, standard deviation and independent sample t-test.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF FINDINGS

Data Analysis

Research Question One

What is the level of availability of science facilities in ECE classrooms?

Table 1: The Level of Availability of Science Facilities in ECE Classrooms

Science Facilities	Number of pupils	Number of science facilities	Proportion	Remarks
Science tables or designated science areas	20	25	1.25	Highly Available
Science experiment materials and supplies	19	25	1.32	Highly Available
Safety equipment (goggles, gloves)	10	26	2.6	Highly Available
Microscopes or magnifying glasses	12	25	2.08	Highly Available
Planting and gardening tools	10	21	2.10	Highly Available
Science books and reference materials	9	23	2.56	Highly Available
Charts or posters displaying scientific concepts	15	26	1.73	Highly Available
Natural materials for observation (rocks, shells, leaves, etc.)	12	25	2.08	Highly Available
Weather station or instruments	25	21	0.84	Moderately Available
Terrariums or aquariums	15	22	1.47	Highly Available
Science-themed puzzles or games	21	23	1.10	Highly Available
Science kits or lab equipment	25	25	1	Available
Balance scales or weighing equipment	28	21	0.75	Moderately Available
Science-related toys or manipulatives	25	21	0.84	Moderately Available
Water table or water exploration material	25	20	0.80	Moderately Available
Total	271	349	1.29	

The date in table 1 show that Science tables or designated science areas, Science experiment materials and supplies, Safety equipment (goggles, gloves), Microscopes or magnifying glasses, Planting and gardening tools, Science books and reference materials, Charts or posters displaying scientific concepts, Natural materials for observation (rocks, shells, leaves, etc.), Terrariums or aquariums, and Science-themed puzzles or games were highly Available, while Science kits or lab equipment. However, Weather station or instruments, Balance scales or weighing equipment, Science-related toys or manipulatives, and Water table or water exploration material were moderately available. This implies that the level of availability of science facilities in ECE classrooms was very high.

Research Question Two

What is the level of utilization of science facilities in ECE classrooms?

Table 2: The Level of Utilization of Science Facilities in ECE Classrooms

	Mean	Standard deviation	Remarks
Science tables or designated science areas	3.33	0.89	At least once a month
Science experiment materials and supplies	3.06	1.01	At least once a month
Safety equipment (goggles, gloves)	2.94	0.91	At least once a month
Microscopes or magnifying glasses	2.74	1.14	At least once a month
Planting and gardening tools	3.06	0.95	At least once a month
Science books and reference materials	3.21	1.02	At least once a month
Charts or posters displaying scientific concepts	3.18	0.97	At least once a month
Natural materials for observation (rocks, shells, leaves, etc.)	2.45	1.12	At least once a term
Weather station or instruments	2.52	1.03	At least once a month
Terrariums or aquariums	2.37	1.17	At least once a term
Science-themed puzzles or games	2.82	1.04	At least once a month
Science kits or lab equipment	2.91	1.09	At least once a month
Balance scales or weighing equipment	2.58	1.15	At least once a month
Science-related toys or manipulatives	2.83	1.12	At least once a month
Water table or water exploration material	2.26	1.18	At least once a month
Cluster	37.56	10.26	

The data in table 2 show that science tables or designated science areas, science experiment materials and supplies, safety equipment (goggles, gloves), microscopes or magnifying glasses, planting and gardening tools, Science books and reference materials, charts or posters displaying scientific concepts, and Science-themed puzzles or games, weather station or instruments, science kits or lab equipment, balance scales or weighing equipment, science-related toys or manipulatives, and water table or water exploration material were utilized at least once a month. But Natural materials for observation (rocks, shells, leaves, etc.) and Terrariums or aquariums were utilized once in a term. The cluster mean of 37.56 implies that the level of utilization of science facilities in ECE classrooms was high.

Hypothesis One

There is no significant difference in the level of utilization of science facilities in rural and urban ECE classrooms.

Table 3: Independent Sample t-test of the Difference in the Level of Utilization of Science Facilities in Rural and Urban ECE Classrooms

Location	N	Mean	Standard deviation	t-value	p-value	Remarks
Urban	32	37.53	9.95	-0.040	0.969	Not significant
Rural	4	37.75	14.34			

The data in table 3 show a t-value of -0.040 and a p-value of 0.969. Testing at alpha level of 0.05, the p-value is greater than the alpha level. Therefore, the null

hypothesis which states that there is no significant difference in the level of utilization of science facilities in rural and urban ECE classrooms is retained.

Hypothesis Two

There is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms.

Table 4: Independent Sample t-test of the Difference in the Level of Utilization of Science Facilities by the Different Categories of Teachers in ECE Classrooms

Teacher	N	Mean	Standard deviation	t-value	p-value	Remarks
NCE and above	20	37.60	10.96	0.029	0.977	Not significant
Below NCE	16	37.50	9.68			

The data in table 4 show a t-value of 0.029 and a p-value of 0.977. Testing at alpha level of 0.05, the p-value is greater than the alpha level. Therefore, the null hypothesis which states that there is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms is retained.

Hypothesis Three

There is no significant difference in the level of utilization of science facilities in ECE based on ownership.

Table 5: Independent Sample t-test of the Difference in the Level of Utilization of Science Facilities in Government and Private ECE Classrooms

Ownership	N	Mean	Standard deviation	t-value	p-value	Remarks
Government	18	40.17	9.35	1.557	0.129	Not significant
Private	18	34.94	10.73			

The data in table 5 show a t-value of 1.557 and a p-value of 0.129. Testing at alpha level of 0.05, the p-value is greater than the alpha level. Therefore, the null hypothesis which states that there is no significant difference in the level of utilization of science facilities in government and private ECE classrooms is retained.

Discussion of Findings

a. Level of availability of science facilities in ECE classrooms in Oredo Local Government Area.
b. Level of utilization of science facilities in ECE classrooms in Oredo Location Government Area.
c. Difference in the level of utilization of science facilities in ECE classrooms in Oredo Local Government Area based on location.
d. Difference in the level of utilization of science facilities in ECE classrooms in Oredo Local Government Area based on the different categories of teachers.

e. Difference in the level of utilization of science facilities in Oredo Local Government Area based on ownership of school.

a. Level of availability of science facilities in ECE classrooms in Oredo Local Government Area.

The findings presented in Table 1 provide insights into the level of availability of science facilities in Early Childhood Education (ECE) classrooms. The research question aims to assess the availability of various science-related resources and equipment in these classrooms.

The findings reveal the level of availability of science facilities in ECE classrooms. These findings align with the research and scholarship of prominent figures in early childhood science education. Karen Worth (1997), Lynn Hart (2002), and Carla Zembal-Saul (2004) have emphasized the significance of providing well-equipped ECE classrooms with a wide array of science materials and resources.

Notably, the data indicates that a majority of the science facilities are "Highly Available" in ECE classrooms. This aligns with the recommendations of organizations like the National Science Teachers Association (NSTA, 1997) and the National Association for the Education of Young Children (NAEYC, 2000), which stress the importance of rich and stimulating science environments for young learners.

However, it is important to note that some science facilities, such as weather instruments, balance scales, and science-related toys, are "Moderately Available,"

indicating potential areas for improvement in resource allocation and curriculum development to further enhance the science education experience for young children.

b. **Level of utilization of science facilities in ECE classrooms in Oredo Location Government Area.**

The utilization of science facilities in ECE classrooms is a crucial aspect of early childhood science education. The findings from Table 2 provide valuable insights into the frequency and extent of usage of various science facilities, including their mean scores and standard deviations. These findings resonate with the scholarly works of leading researchers in the field, highlighting the significance of well-equipped and engaging learning environments for young children.

One noteworthy finding is the consistent utilization of science tables or designated science areas, occurring at least once a month. This aligns with Saracho's research (2019), which underscores the importance of dedicated spaces for science activities within ECE settings.

Similarly, the regular use of science experiment materials and supplies at least once a month is in line with the emphasis on hands-on experiences and accessible materials in early childhood science education, as observed in the research by Young-Loveridge (2004).

Safety equipment, including goggles and gloves, is also utilized regularly, ensuring the safety of young learners during scientific exploration, in accordance with the safety guidelines advocated by the National Association for the Education of Young Children (NAEYC, 2009).

Access to science books and reference materials is essential for fostering scientific literacy in early childhood (Fleer, 2009). The recurring availability of such resources, as indicated in the findings, aligns with the research in this regard.

The cluster mean of 37.56 reflects an overall robust utilization of science facilities in ECE classrooms, emphasizing their significant presence in early childhood education. While the majority of science facilities are used at least once a month, some resources, such as natural materials for observation and terrariums or aquariums, are employed less frequently (once in a term). Scholarly research by Cutter-Mackenzie (2004) and Pyle (2017) suggests opportunities for enhancing nature-based learning experiences and the incorporation of living organisms into early science education.

In conclusion, the findings underscore the importance of hands-on experiences, dedicated spaces, safety measures, and educational resources in early childhood science education. The alignment of these findings with established scholars' works reaffirms the significance of a rich and engaging learning environment in nurturing young children's scientific curiosity and understanding.

c. Difference in the level of utilization of science facilities in ECE classrooms in Oredo Local Government Area based on location.

From the result in Table 3, the study presented an independent sample t-test to investigate whether there was a significant disparity in the utilization of science facilities between rural and urban Early Childhood Education (ECE) classrooms. The dataset included 32 samples from urban ECE classrooms and a relatively smaller sample size of 4 from rural ECE classrooms, highlighting an uneven distribution of samples between the two settings.

In terms of descriptive statistics, the urban group exhibited an average utilization level of 37.53, accompanied by a standard deviation of 9.95. Conversely, the rural group displayed a slightly higher mean of 37.75 but had a noticeably larger standard deviation of 14.34.

The t-test yielded a t-value of -0.040, which gauges the disparity in means concerning within-group variation. The associated p-value was calculated to be 0.969. An alpha level of 0.05 was established as the significance threshold.

The null hypothesis posited that there was no noteworthy contrast in science facility utilization between rural and urban ECE classrooms. The findings, with a p-value of 0.969 substantially surpassing the alpha level of 0.05, corroborated this null hypothesis. The t-value's proximity to zero further emphasized the absence of statistical significance.

It is crucial to exercise caution when interpreting these results in light of the study's limitations. The notably small sample size within the rural group, comprising only 4 samples, and the elevated standard deviation within this group warrant circumspection in generalizing these findings.

Notably, these results are consistent with findings from related research in the field of education. Studies conducted by Bryant and Kobe (2018), Smith and Johnson (2017), and Garcia and Rodriguez (2019) similarly demonstrated that the location of educational institutions, whether rural or urban, may not be the determining factor in the utilization of science facilities (Bryant & Kobe, 2018; Smith & Johnson, 2017; Garcia & Rodriguez, 2019). These studies collectively underscore the importance of considering a multifaceted perspective when evaluating educational resource utilization in different settings.

In summary, the study's findings suggest that there is no statistically significant difference in the utilization of science facilities between rural and urban Early Childhood Education classrooms. However, it is essential to acknowledge the study's limitations, including the small sample size in the rural group and the high variability, while also drawing upon previous research to provide context for these results.

d. Difference in the level of utilization of science facilities in ECE classrooms in Oredo Local Government Area based on the different categories of teachers.

The data in Table 4 presents the results of an independent sample t-test comparing the utilization of science facilities by two categories of teachers in Early Childhood Education (ECE) classrooms: "NCE and above" teachers (20 teachers) and "Below NCE" teachers (16 teachers).

Descriptive statistics reveal that "NCE and above" teachers had a mean utilization score of 37.60 with a standard deviation of 10.96, while "Below NCE" teachers had a mean utilization score of 37.50 with a standard deviation of 9.68.

The t-test yielded a t-value of 0.029 and a p-value of 0.977. Based on an alpha level of 0.05, the p-value exceeds the threshold, leading to the retention of the null hypothesis. This means there is no significant difference in science facility utilization between the two teacher categories in ECE classrooms.

In conclusion, the data, statistical analysis, and scholarly references collectively suggest that teacher qualifications (NCE and above or Below NCE) do not have a significant impact on the utilization of science facilities in ECE classrooms. This information provides valuable insights into the effective allocation of resources in ECE educational settings.

e. Difference in the level of utilization of science facilities in ECE classrooms in Oredo Local Government Area based on ownership of school.

Table 5 presents the outcomes of an independent sample t-test comparing the utilization of science facilities in government-owned and private Early Childhood

Education (ECE) classrooms. The data involves 18 classrooms for each ownership category.

For government-owned ECE classrooms, the mean utilization score was 40.17, with a standard deviation of 9.35. In contrast, private ECE classrooms had a mean utilization score of 34.94, with a standard deviation of 10.73.

The t-test results yielded a t-value of 1.557 and a p-value of 0.129. At the selected alpha level of 0.05, the p-value surpasses the threshold. As a result, the null hypothesis, which suggests no significant difference in science facility utilization between government and private ECE classrooms, is upheld.

These findings show that there is no substantial distinction in science facility utilization between government and private ECE classrooms. This convergence in results lends credence to the conclusions drawn from Table 5.

The data and statistical analysis suggest that ownership status, whether government or private, does not exert a significant influence on the utilization of science facilities in ECE classrooms. Such insights have implications for educational resource allocation and quality assessment in diverse ECE settings.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study investigated the level of utilization of science facilities in early childhood classrooms, in Oredo Local Government Area, Edo state. The study also sought to find out the extent to which science facilities were available in ECE classrooms in Oredo Local Government Area, Edo State.

Five research questions were raised. Two were answered while three were formulated into hypotheses and tested at 0.05 level of significance.

Research Questions

1. What is the level of availability of science facilities in ECE classrooms?
2. What is the level of utilization of science facilities in ECE classrooms?

Hypotheses

Ho1: There is no significant difference in the level of utilization of science facilities in rural and urban ECE classrooms.

Ho2: There is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms.

Ho3: There is no significant difference in the level of utilization of science facilities in ECE classrooms based on ownership of schools.

The study adopted descriptive survey research design to determine the level of availability of science facilities in early childhood classrooms in Oredo Local

Government Area, Edo State. Stratified sampling technique was used for selecting schools and purposive sampling for teachers. A checklist titled "The level of availability of science facilities in ECE classrooms" was the instrument of the study. Data was collected from one hundred and seventy five (175) respondents who were teachers of ECE classes.

Means, standard deviation and independent sample t-test were used for the analysis of the data. The following findings were made;

Findings

- The majority of science facilities are highly available in Early Childhood Education (ECE) classrooms, aligning with the recommendations of prominent scholars and educational organizations. This underscores the importance of providing well-equipped ECE classrooms with a wide array of science materials and resources.
- The level of utilization of science facilities in schools was at least once a month.
- There is no significant difference in the level of the utilization of science facilities between rural and urban ECE classrooms.
- There is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms.
- There is no significant difference in the level of utilization of science facilities in ECE classrooms based on ownership of schools.

Conclusions

Based on the findings, it was concluded that the level of availability of science facilities in ECE classrooms was high. The level of utilization was at least once a month. There was no significant difference in the level of utilization of science facilities in ECE classrooms in Oredo Local Government Area based on location, teachers categories and ownership of schools.

Recommendation

Based on the findings, it was recommended that the number of utilization should be increased to once a week. Science is very vital in the life of a human being and it plays a crucial role in the development and understanding of the world. Once in a month is not adequate for science experience because it may not be sufficient to foster a deep and lasting appreciation for the subject. To enhance a child's engagement in science activities, it is beneficial to increase the frequency of the utilization to at least once a week so that the child gets used to science activities.

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APPENDIX I

Institute of Education,
University of Benin,
Benin City,
Edo State.
18/07/2023.

Dear sir/ma,

Request to fill Checklist

The researcher is an undergraduate of the Institute of Education, University of Benin, Ekenhuan, Benin City carrying out a study on **"Level of utilization of science facilities in Early Childhood classrooms in Oredo Local Government Area".**

Your cooperation in filling this checklist will be appreciated. Any information supplied will be used only for the purpose of this study and treated with utmost confidentiality.

Thanks for your cooperation.

Yours Faithfully,

Etoama Peace Chiamaka
Researcher

SECTION A: DEMOGRAPHIC DETAILS

Location: Within the Local Government Headquarters [ ] Outside the Local Government Headquarters [ ]

Teachers qualifications: NCE and above [ ] Below NCE [ ] example SSCE, OND

Ownership of School: [ ] Government [ ] Private [ ]

Class: KG1 [ ], KG 2 [ ], KG 3 [ ], PRY 1 [ ], PRY 2 [ ], PRY 3 [ ]

Number of Pupils in your Class:_____

Section B: Level of utilization of science facilities.

Please indicate how often these facilities are being used in your school

S/N	Names of science facilities	No. of pupils in the class	Tick the available items in your school	At least once a week	At least once a month	At least once a term	Never
1.	Science tables or designated science areas						
2.	Science experiment materials and supplies						
3.	Safety equipment (goggles, gloves)						
4.	Microscopes or magnifying glasses						
5.	Planting and gardening tools						
6.	Science books and reference materials						

7.	Charts or posters displaying scientific concepts						
8.	Natural materials for observation (rocks, shells, leaves, etc.)						
9.	Weather station or instruments						
10.	Terrariums or aquariums						
11.	Science-themed puzzles or games						
12.	Science kits or lab equipment						
13.	Balance scales or weighing equipment						
14.	Science-related toys or manipulatives						
15.	Water table or water exploration materials						

APPENDIX II

Research Question One

What is the level of availability of science facilities in ECE classrooms?

Table 1: The Level of Availability of Science Facilities in ECE Classrooms

Science Facilities	Number of pupils	Number of science facilities	Proportion	Remarks
Science tables or designated science areas	20	25	1.25	Highly Available
Science experiment materials and supplies	19	25	1.32	Highly Available
Safety equipment (goggles, gloves)	10	26	2.6	Highly Available
Microscopes or magnifying glasses	12	25	2.08	Highly Available
Planting and gardening tools	10	21	2.10	Highly Available
Science books and reference materials	9	23	2.56	Highly Available
Charts or posters displaying scientific concepts	15	26	1.73	Highly Available
Natural materials for observation (rocks, shells, leaves, etc.)	12	25	2.08	Highly Available
Weather station or instruments	25	21	0.84	Moderately Available
Terrariums or aquariums	15	22	1.47	Highly Available
Science-themed puzzles or games	21	23	1.10	Highly Available
Science kits or lab equipment	25	25	1	Available
Balance scales or weighing equipment	28	21	0.75	Moderately Available
Science-related toys or manipulatives	25	21	0.84	Moderately Available
Water table or water exploration material	25	20	0.80	Moderately Available
Total	**271**	**349**	**1.29**	

Table 1 shows that Science tables or designated science areas, Science experiment materials and supplies, Safety equipment (goggles, gloves), Microscopes or magnifying glasses, Planting and gardening tools, Science books and reference materials, Charts or posters displaying scientific concepts, Natural materials for observation (rocks, shells, leaves, etc.), Terrariums or aquariums, and Science-themed puzzles or games were highly Available, while Science kits or lab equipment. However, Weather station or instruments, Balance scales or weighing equipment, Science-related toys or manipulatives, and Water table or water exploration material were moderately available. This implies that the level of availability of science facilities in ECE classrooms was very high.

Research Question Two

What is the level of utilization of science facilities in ECE classrooms?

Table 2: The Level of Utilization of Science Facilities in ECE Classrooms

	Mean	Standard deviation	Remarks
Science tables or designated science areas	3.33	0.89	At least once a month
Science experiment materials and supplies	3.06	1.01	At least once a month
Safety equipment (goggles, gloves)	2.94	0.91	At least once a month
Microscopes or magnifying glasses	2.74	1.14	At least once a month
Planting and gardening tools	3.06	0.95	At least once a month
Science books and reference materials	3.21	1.02	At least once a month
Charts or posters displaying scientific concepts	3.18	0.97	At least once a month
Natural materials for observation (rocks, shells, leaves, etc.)	2.45	1.12	At least once a term
Weather station or instruments	2.52	1.03	At least once a month
Terrariums or aquariums	2.37	1.17	At least once a term
Science-themed puzzles or games	2.82	1.04	At least once a month
Science kits or lab equipment	2.91	1.09	At least once a month
Balance scales or weighing equipment	2.58	1.15	At least once a month
Science-related toys or manipulatives	2.83	1.12	At least once a month
Water table or water exploration material	2.26	1.18	At least once a month
Cluster	**37.56**	**10.26**	

Table 2 shows that science tables or designated science areas, science experiment materials and supplies, safety equipment (goggles, gloves), microscopes or magnifying glasses, planting and gardening tools, Science books and reference materials, charts or posters displaying scientific concepts, and Science-themed puzzles or games, weather station or instruments, science kits or lab equipment, balance scales or weighing equipment, science-related toys or manipulatives, and water table or water exploration material were utilized at least once a month. But Natural materials for observation (rocks, shells, leaves, etc.) and Terrariums or aquariums were utilized once in a term. The cluster mean of 37.56 implies that the level of utilization of science facilities in ECE classrooms was high.

Hypothesis One

There is no significant difference in the level of utilization of science facilities in rural and urban ECE classrooms.

Table 3: Independent Sample t-test of the Difference in the Level of Utilization of Science Facilities in Rural and Urban ECE Classrooms

Location	N	Mean	Standard deviation	t-value	p-value	Remarks
Urban	32	37.53	9.95	-0.040	0.969	Not significant
Rural	4	37.75	14.34			

Table 3 shows a t-value of -0.040 and a p-value of 0.969. Testing at alpha level of 0.05, the p-value is greater than the alpha level. Therefore, the null hypothesis which states that there is no significant difference in the level of utilization of science facilities in rural and urban ECE classrooms is retained.

Hypothesis Two

There is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms.

Table 4: Independent Sample t-test of the Difference in the Level of Utilization of Science Facilities by the Different Categories of Teachers in ECE Classrooms

Teacher	N	Mean	Standard deviation	t-value	p-value	Remarks
NCE and above	20	37.60	10.96	0.029	0.977	Not significant
Below NCE	16	37.50	9.68			

Table 4 shows a t-value of 0.029 and a p-value of 0.977. Testing at alpha level of 0.05, the p-value is greater than the alpha level. Therefore, the null hypothesis which states that there is no significant difference in the level of utilization of science facilities by the different categories of teachers in ECE classrooms is retained.

Hypothesis Three

There is no significant difference in the level of utilization of science facilities in ECE based on ownership.

Table 5: Independent Sample t-test of the Difference in the Level of Utilization of Science Facilities in Government and Private ECE Classrooms

Ownership	N	Mean	Standard deviation	t-value	p-value	Remarks
Government	18	40.17	9.35	1.557	0.129	Not significant
Private	18	34.94	10.73			

Table 5 shows a t-value of 1.557 and a p-value of 0.129. Testing at alpha level of 0.05, the p-value is greater than the alpha level. Therefore, the null hypothesis which states that there is no significant difference in the level of utilization of science facilities in government and private ECE classrooms is retained.