Evaluation of Key Design Elements for Play-Learning Environment in Elementary Schools in Minna, Nigeria

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Abstract
In an era of climate change and a time when pupils especially those in elementary schools spend most of their time indoors, attempt to entice and encourage children and their teachers to spend more time in well-structured, child-centred green designed school grounds is timely and cannot be overemphasized. Creating an outdoor learning and play environment is an initiative that would incorporate green design principles targeted at meeting children's developmental needs. Children developmental needs are cognitive, physical, social and emotional. This paper assessed the physical outdoor spaces and natural elements in elementary schools with a view to integrating these elements in elementary schools in Minna, Niger State. The research was carried out by the use of a structured observation schedule and questionnaires. Data collected were analyzed using descriptive statistical tools such as mean, percentages and averages. The findings revealed that only 25% of the playgrounds of elementary schools in Minna have above average fixed components. It also showed that no provisions were made for experimental, individual, gathering and ecological spaces. The results generated were shown in tables. The paper recommended that play-learning environment be integrated in elementary schools in Minna.
Keywords: Developmental needs, elementary schools, green designed, space, play-learning.

Introduction

In the world over, every child plays. The drive to play in children is so profound that children will make effort to do so in the midst of any circumstance. Young children consider pretending, running and building as fun (Whitebread, 2012). It is a well-known fact to researchers and educators that these playful activities are of immense benefit to the development of the whole child across social, cognitive, physical and emotional domains. Play is indeed very instrumental to a healthy child's development; it is no wonder that the American Academy of Pediatrics issued a white paper on the topic (Ginsburg, 2007). The National Association for the Education of Young Children (2009) named play as a central component in developmentally appropriate educational practices, and the United Nations High Commission on Human Rights (1989) recognized play as fundamental right for every child.

Play has a wide range of definitions ranging from discrete descriptions of various types of play such as physical, construction play, language play, or symbolic play (Miller and Almon, 2009), to a list of broad criteria, based on observations and attitudes that are meant to capture the essence of all play behaviours (Rubin *et al.*, 1983).

Contemporary definitions of play focus on a number of key criteria. The founder of the National Institute for Play, Stuart Brown in his words defines play as anything that spontaneously is done for its own sake. Similarly, Krasnor and Pepler (1980) and Rubin *et al.* (1983) defined play along a continuum as more or less playful using a set of behavioural and dispositional criteria. Play includes activities that are freely chosen and directed by children and arise from intrinsic motivation (Miller and

Almon, 2009). Today under the pressure of rising academic standards in our elementary schools, play has been given trivial consideration. In our society today, a pseudo dichotomy has been created between play and learning.

This paper therefore, seeks to discourage the strict relegation of learning to the four walls of the classroom by assessing the physical outdoor spaces and natural elements in elementary schools with a view to integrating these elements in elementary schools in Minna, Niger state. This research will encourage outdoor learning through play thereby reducing the time spent by pupils in the classrooms.

The Importance of Play

Play builds the foundation for a lifetime of learning. Play is pleasurable, intrinsically motivated, freely chosen and is process oriented. Play is also non-literal and is actively engaged. According to American Academy of Pediatrics (2016), children playful behaviours can range from 0-100% playful. It is through play that children at a very early age engage and interact in the world around them. The American Academy of Pediatrics titled "The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds" elucidates on the importance of play to the healthy development of children. Among other things, the report says the" play allows children to use their imagination, dexterity, and physical, cognitive and emotional strength"(p.151). Play is important to the development of healthy brain. Children stand the chance to learn how to work in groups, to negotiate, to share and to resolve differences, and to learn self-advocacy skill (Heidi, 2013). These aforementioned benefits of play would be impossible without a well-structured and conducive environment that can foster and instigate

children and their teachers to spend appreciable outdoor time to play and learn.

It is alarming that as experts are arguing and yet to come to terms with the importance of play in the lives of children, the actual time children spend daily in playing continues to decrease. Today, children play eight hours less each week than their counterparts did two decades ago (Elkind, 2008).

Play as a Pedagogy

Moyles *et al*. (2002) examined that although adults endorsed the educational benefits of play, they were uncertain of their role in play and how to assess the prospects of play. Professional knowledge and expertise is critical in planning and engaging in playing, learning and teaching. Siraj-Blatchford *et al*. (2002) studied effective pedagogy and distinguished between pedagogical framing (planning for play, providing resources and a routine) on behalf of adults and pedagogical interactions (specific behaviors in face to face encounters), and established that both are required. In conclusion they emphasized that the most effective settings had a balance between adult-initiated and child-initiated activities.

Play is a natural medium through which learning and development is holistically enhanced. As suggested by Hayes (2003), "Play is a pedagogical tool for the teacher as well as a pathway for learning for a child"(p.122). It is obvious that young children learn through play in a composite system.

Components of a Supportive Environment

Outdoor and indoor learning environments should be motivating and inviting to all children, so that they are encouraged and helped to explore and to use all the possibilities offered for fun, adventure, challenge and creativity as stated by

National Council for Curriculumn and Assessment (NCCA, 2004).The physical environment, both indoors and outdoors, encourages positive growth and development for children through opportunities to explore and learn. Safe, clean, spacious, bright, welcoming, warm, and accessible environments for children and adults, including those with additional needs, should afford opportunities to rest and play. Babies, toddlers and young children need fresh air and outdoor play space is essential if children are to have a balanced, healthy day. Learning is constrained and may be damaged if young children are required to sit still indoors, where adults do most of the talking and require children to follow their lead (Bruce, 2004). The environment should offer children opportunities to: actively explore, make decisions and follow through with their ideas; engage in co-operative, symbolic, dramatic or pretend play; move, dance and increase control over their bodies (Hohmann and Weikart, 1995).

Socio-cultural theory is concerned with children's learning in context. Children respond to the reality they see around them and what they learn reflects that reality (Penn, 2005). Environments can reflect the lives and activities of the children/families in the service to establish positive identities. In addition, environments can have resources to counteract stereotypical and discriminatory attitudes (French, 2003).

The same principles apply whether organizing indoor or outdoor areas. In fact many of the activities babies, toddlers and young children enjoy indoors can be achieved outdoors and with greater freedom. If in group care, careful consideration of the organizing of rooms for different age groups is necessary. Babies and toddlers need a room or home base where they can relate for part of the day with a small group of children and adults, where they can feel secure and build relationships. Older children need more space (French, 2003).

A supportive environment is one structured to meet the developmental needs of children. The developmental needs include emotional development, physical development, social development and cognitive development needs. It is paramount to note that any distinct space on the playground is likely to have both fixed and movable components and serving a range of developmental needs (Heidi, 2013). Fixed landscape components are the anchor points of a landscape, for example, trails, groves of trees, hills, and rock circles. These components must be thoughtfully arranged, to prioritize connectivity, maintain flexibility and create a kind of "loose fit" that allows educators and children to play an active part in adding moveable components to customize their play-learning environment (Heidi, 2013).

A menu for moveable components was suggested by Heidi (2013), to serve as objects that enhances play and can be incorporated into the play space as seen in figure I. They include but not limited to:

1. Containers: milk crates, buckets
2. Gardening equipment: wheelbarrows, gloves, watering cans
3. Chalk boxes and tubes
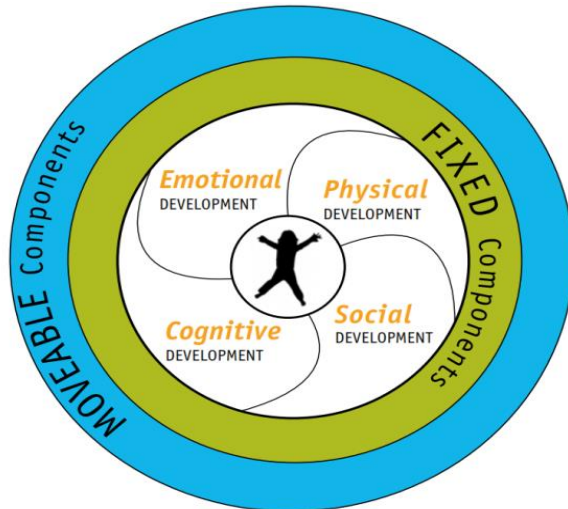4. Dirt, mud, cob, sand and water.

Fig. I. Fixed and moveable components serving developmental needs. Source: Heidi (2013)

Creating a Supportive Environment

Smith *et al*. (2005) advocated that the learning environment should be carefully planned to meet children needs by providing them with the optimum opportunities to work independently, to make choices, decisions and solve problems, to engage in real experiences, and to experience success. The High and Scope Educational Research Foundation (2001) suggested that the space should be inviting for children and organize into well-defined areas of interest to encourage distinctive types of play. Hohmann and Weikart (1995) noted that the interest areas are arranged to promote visibility and easy movement between areas and are flexible to accommodate children changing interests. Curtis and O'Hagan (2004) promoted a variety of easily accessible, open-ended, natural, found, real life materials which can be used in creative and purposeful ways and reflect children's family lives. Materials are stored so that children can find, use and return materials they need. The most effective learning comes from simple but versatile materials and environments which extend the child's imagination and can be adapted by children to suit their learning needs and level of understanding. Dowling

(2000) referred to this as an informational environment which supports children ability to make and learn from mistakes, discover the best way of doing things and learn how to make decisions.

Integrating Key Spaces into Play-Learning Environments

Developing a conceptual design for a play-learning environment will require the bringing together entire piece together- the fixed and moveable landscape components, children developmental needs and the desired spatial qualities of the site. It was advocated that priority be placed on five key spaces that should work in concert to create a diversity of play and learning opportunities (Heidi, 2013). The key spaces as described by Heidi (2013) are active spaces, experimental spaces, individual spaces, gathering spaces and ecological spaces as indicated in figure II.
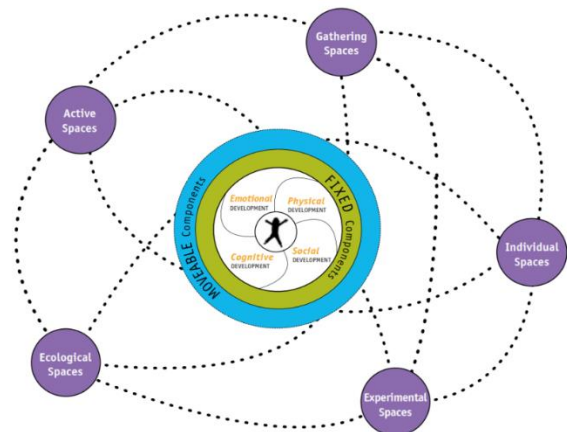

Fig. II. Key spaces in play-learning environments
Source: Heidi (2013)

Active Spaces

Spaces that encourage active play vary in topography, incorporate changes in height, challenge the mind to assess competencies and go beyond perceived limits. Plate I explains how these spaces feel energetic as they promote fitness and health.

Plate I. Active Space   Source: Heidi (2013)

Experimental Spaces

These are spaces for discovery, exploration, hypothesizing. They are temporary in nature. They are also flexible, alive, messy and emergent. They should feel more like a lab, a space that supports creativity, constructing, building, testing and idea generating. Plate II identifies spaces that are often very social, offering opportunities for the development of communication/language skills. They are filled with materials, and have child sized furnishings and storage. Mud, sand, water, wood, buckets, tools and other types of loose parts are essential. Educational materials such as hand lenses, clipboards, pencils and cameras should be used (Heidi, 2013).

Plate IV. Experimental Space
Source: Heidi (2013)

Individual Spaces

Individual spaces support quiet reflective moments, observation and listening as shown in plate III. They feature small

enclaves that are protected, cozy and enclosed. This type of space would accommodate one or two children and could be on the edge of another play zone, most likely away from an active play area. This is a space for private time. Some children are sensitive to noise and have need for a quiet space in the playground (Heidi, 2013).

Plate III. Individual Space
Source: Heidi (2013)

Gathering Spaces

Gathering spaces can be for a large or small group. Plate IV describes a typical welcoming, fostering of social interaction, and focused on communication, negotiation, and sharing. They offer seating, shade, and should have a balance of soft and hard features (Heidi, 2013). They should be flexible and accommodate multiple use and users (staff, children, parents).

Plate IV. Gathering Space Source: Heidi (2013)

Ecological Spaces

Trees, shrubs, and vegetation are strong elements of these spaces. They are alive, containing ecosystems that attract birds, butterflies, insects, and worms. They offer children access to water, soil, and plants (plate V). They create habitat on different scales and will attract a diversity of plant and insect species. They evoke an emotional response, nurture a sense of responsibility, and offer moments for reflection(Heidi, 2013).

Plate V Ecological Space   Source: Heidi (2013)

Research Method

The research method employed to carry out this study was the use of post-occupancy survey research. An observation schedule was structured to evaluate the physical outdoor spaces and natural elements available in primary school play grounds. The assessment was conducted in Minna, Niger state, Nigeria. Two local governments which lie within Minna are Bosso and Chanchaga Local governments. Ten public primary schools were selected at random from each of these local government areas by simple random technique of probability sampling method. The selection of public schools was based on the fact that large populations of pupils in Niger State attend public schools and has a wide variety of spread across the wards in the area. The data was collected and analyzed using descriptive statistical tools such as mean, percentages and averages in a tabular format.

Ten public schools selected from each the two local government local areas are tabulated below:

Table 1.0: Schools selected in Bosso local government area

S/No	Name of Primary School
1	Baban Dabo Primary School
2	Dr. Yahaya Bawa Bosso Pry Sch.
3	Gusase Primary School
4	Gurusu Primary School
5	Jikuchi Ube Primary School
6	Kadna Primary School
7	Maitumbi Primary School
8	Shango Primary School
9	Tudun-Fulani Model School
10	Kwarkwota Primary School

Table 2.0: Schools selected in Chanchaga local government area

S/No	Name of Primary School
1	Shango Primary School
2	Aliyu Mu'azu Sarkin Yakin Mem. Sch.
3	Anguwan Zakka Primary School
4	Dr.Umar Farouk Primary School
5	Ibb Primary School
6	Kuyanbana Primary School
7	Usman Nagogo Primary School
8	Limawa Model Primary School
9	Tunga North Primary School
10	Umar Audi Memorial Primary Sch

Findings and Discussion of Results

The results obtained through observation schedules were recorded using following representations.

0   -not available

1   - available

The result in Table 3.0 shows that all the playgrounds of the schools had both hard and soft surfaces required for physical development. It also shows that 85% of groves of trees will enhance the emotional development of children. It further shows that only 10% of the playgrounds have hills which support cognitive learning, 20% of rock circles which support social

development but none had trails or pathways in the playgrounds.

Table 4.0 shows that all the playgrounds had either sand or mud or both and chalk boxes which support emotional and cognitive developments in children during play. No playground had a play table which supports both cognitive and social development and only 25% had garden equipment which also supports cognitive developments in children.

Table 5.0 shows that the only type of play space available in the playgrounds of the selected primary schools is the active space. The ecological space, individual space, experimental and gathering space which support play-learning environments are not available. The environment should offer children opportunities to: actively explore, make decisions and follow through with their ideas; engage in co-operative, symbolic, dramatic or pretend play; move, dance and increase control over their bodies.

Table 3.0: Fixed components in playgrounds

S/No	List of Schools	Hard/Soft Sur.	Hills	Rock Circles	Groves Of Trees	Trails	Total
01	Baban Dabo Primary School	1	0	0	1	0	40%
02	Chanchaga Primary School	1	0	0	1	0	40%
03	Dr. Yahaya Bawa Bosso Pry Sch.	1	0	1	1	0	60%
04	Gusase Primary School	1	0	0	0	0	20%
05	Gurusu Primary School	1	0	0	1	0	40%
06	Jikuchi Ube Primary School	1	0	0	1	0	40%
07	Kadna Primary School	1	0	1	1	0	60%
08	Maitumbi Primary School	1	1	0	1	0	60%
09	Shango Primary School	1	0	0	1	0	40%
10	Tudun-Fulani Model School	1	0	0	1	0	40%
11	Aliyu Mu'azu Sarkin Yakin Mem. Sch.	1	1	0	1	0	60%
12	Anguwan Zakka Primary School	1	0	0	1	0	40%
13	Dr.Umar Farouk Primary School	1	0	0	1	0	40%
14	Ibb Primary School	1	0	0	1	0	40%
15	Kuyanbana Primary School	1	0	1	1	0	60%
16	Kwarkwota Primary School	1	0	0	0	0	20%
17	Limawa Model Primary School	1	0	0	1	0	40%
18	Tunga North Primary School	1	0	1	0	0	40%
19	Umar Audi Memorial Primary Sch	1	0	0	1	0	40%
20	Usman Nagogo Primary School	1	0	0	1	0	40%
	Total	**100%**	**10%**	**20%**	**85%**	**0%**	

Table 4.0: Moveable components in playgrounds

S/No	List Of Schools	Containers	Garden Equip.	Chalk Boxes	Sand/ Mud	Play Tables	Total
01	Baban Dabo Primary School	0	0	1	1	0	40%
02	Chanchaga Primary School	1	1	1	1	0	80%
03	Dr. Yahaya Bawa Bosso Pry Sch.	1	0	1	1	0	60%
04	Gusase Primary School	0	0	1	1	0	40%
05	Gurusu Primary School	1	0	1	1	0	60%
06	Jikuchi Ube Primary School	0	0	1	1	0	40%
07	Kadna Primary School	1	0	1	1	0	60%
08	Maitumbi Primary School	1	0	1	1	0	60%
09	Shango Primary School	1	1	1	1	0	80%
10	Tudun-Fulani Model School	0	0	1	1	0	40%
11	Aliyu Mu'azu Sarkin Yakin Mem. Sch.	1	0	1	1	0	60%
12	Anguwan Zakka Primary School	0	0	1	1	0	40%
13	Dr.Umar Farouk Primary School	0	0	1	1	0	40%
14	Ibb Primary School	1	0	1	1	0	60%
15	Kuyanbana Primary School	1	1	1	1	0	80%
16	Kwarkwota Primary School	0	0	1	1	0	40%
17	Limawa Model Primary School	1	1	1	1	0	80%
18	Tunga North Primary School	0	0	1	1	0	40%
19	Umar Audi Memorial Primary Sch	1	1	1	1	0	80%
20	Usman Nagogo Primary School	0	0	1	1	0	40%
	Total	**55%**	**25%**	**100%**	**100%**	**0%**	

Table 5.0: Types of spaces required for a play-learning environment.

S/No	List of Schools	Active	Experi- Mental	Indivi- Dual	Gather- Ing	Ecolo- Gical	Total
01	Baban Dabo Primary School	1	0	0	0	0	20%
02	Chanchaga Primary School	1	0	0	0	0	20%
03	Dr. Yahaya Bawa Bosso Pry Sch.	1	0	0	0	0	20%
04	Gusase Primary School	1	0	0	0	0	20%
05	Gurusu Primary School	1	0	0	0	0	20%
06	Jikuchi Ube Primary School	1	0	0	0	0	20%
07	Kadna Primary School	1	0	0	0	0	20%
08	Maitumbi Primary School	1	0	0	0	0	20%
09	Shango Primary School	1	0	0	0	0	20%
10	Tudun-Fulani Model School	1	0	0	0	0	20%
11	Aliyu Mu'azu Sarkin Yakin Mem. Sch.	1	0	0	0	0	20%
12	Anguwan Zakka Primary School	1	0	0	0	0	20%
13	Dr.Umar Farouk Primary School	1	0	0	0	0	20%
14	Ibb Primary School	1	0	0	0	0	20%
15	Kuyanbana Primary School	1	0	0	0	0	20%
16	Kwarkwota Primary School	1	0	0	0	0	20%
17	Limawa Model Primary School	1	0	0	0	0	20%
18	Tunga North Primary School	1	0	0	0	0	20%
19	Umar Audi Memorial Primary Sch	1	0	0	0	0	20%
20	Usman Nagogo Primary School	1	0	0	0	0	20%
	Total	**100%**	**0%**	**0%**	**0%**	**0%**	

Conclusion

The study has revealed that a play-learning playground has not been given any considerable attention. It was observed that only 25% of the playgrounds of primary schools had above average fixed components and 55% had moveable components. It is alarming that no provisions were made for experimental, individual, gathering and ecological play-learning spaces. These would limit or deprive the children certain developmental needs which these spaces would have offered if they were present.

Recommendation

Stake holders, developers and professionals involved in the development of primary schools, should pay adequate attention to these key design considerations which support play-learning playgrounds thereby creating an enabling environment where children developmental needs would thrive.

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