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Effects of Creating Physical Learning Spaces on the Reading Comprehension Skills Performance of Primary Four Pupils

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Abstract

Literacy development in education has been an issue of global concern. In Nigeria, learners in primary schools generally struggle to learn due to poor literacy skills which manifests in their inability to comprehend concepts in the school subjects. It is against this background that several research studies have been carried out on ways of improving the literacy skills of pupils in order to enhance their academic performance, social skills and survival skills. In spite of these efforts, not much has been achieved as reflected in current research findings on literacy skills' performance of pupils in primary schools. This study examined the effects of creating physical learning spaces on the reading comprehension performance of primary four pupils. It is a quasi-experiment using two intact groups: one experimental and one control.

The study was guided by two research questions and two hypotheses. All the primary four pupils in Alvan Ikoku Staff Primary School, Owerri, totalling 120 made up the population for the study. A 50-item researcher-made (Literacy Learning Centres Test, LLCT) reading comprehension test was used as pre and post-tests, to establish statistical equivalence. The pre-test was given to the pupils and the outcome was used to assign 40 subjects to each of the two groups. This experiment lasted for 6 weeks. The result was analysed using t-test and ANOVA. The results showed that there was a significant difference in the mean scores of the pupils taught using Literacy Learning Centres (LLC) and Normal Classroom Environment (NCE) and no significant difference was noted between male and female students taught using LLC. The recommendations include a suggestion that English Language teachers should use local resources to create learning centres for the teaching of the reading in order to enhance comprehension.

Key Words: classroom practices, learning space, comprehension skills, teaching space

Introduction

The rapid growth in technology and the impact of globalization have influenced educational objectives and practices. The impacts of these are reflected in the swing from the 19th and 20th century behaviourists' classroom educational practices to the 21st century cognitive constructivists and social constructivists' educational practices which has led to birth of flexible classroom and varied learning spaces. In the same vein, the increasing demand for soft skills from learners to enable them function in the knowledge driven market has further made the use of varied learning spaces a necessity in teaching and learning.

Learning spaces are crucial in learning; by its nature, type, conduciveness, flexibility and variety, they have influenced teaching and learning greatly. The philosophy and psychology underlying the use of learning spaces in teaching and learning stem from the fact that the society today does not need people who have mastered all the facts/ theories in the text books. Rather, the 21st century society needs people who are flexible, creative, good team players that can think critically, take apt decisions and communicate effectively. To produce this crop of people, there is the need for experiential teaching and learning approaches which recognize the need for collaboration and learner initiated interactions in order to facilitate deep learning through negotiation of meaning. The introduction of an appropriate learning space can be of immense advantage.

Blackmore, Bateman; Loughlin, O'Mara & Aranda (2011) and Student Achievement Division (2012) described a learning space as an environment that responds to our ultimate goal as educators and facilitates the development of independent and rigorous thought in learners. They have the capacity to enable learners acquire the expected skills and acquire rounded education. Learning spaces are generally classified into two- physical and virtual/digital spaces. Before the 21st century, learning spaces were restricted to the physical space, as teaching and learning was conceived as only taking place in the four walls of the classrooms and other similar spaces like the laboratories and libraries. In other words, teaching and

learning was restricted by time and place. These traditional teaching spaces were dominated by one type of design: teacher centered, frontal teaching, and expository method of teaching, with either a U shape or straight rows seating arrangement. However, the rapid growth in technology has led to the emergence of a variety of virtual and digital spaces. These technology based learning spaces are purposefully designed to promote synchronous and asynchronous learning opportunities where users interact with virtual space, digital tools, online content and instructors. In addition, a variety of non-traditional spaces for learning have emerged and these include cafes, the Apple Store, and other hand-held devices. These facilities have now extended and deepened the value of learning spaces by giving learners access to a stream of on-demand content and teachers.

Learning spaces positively influence learning in a number of ways, including the following:

- stimulate and motivate learner participation
- support multiple types of learning activities
- enable connections, inside and out- synchronous and asynchronous learning through collaboration
- integrate information technology seamlessly into learning
- make learning fun rather than a struggle by providing comfort, safety and functionality
- provide ample space for learners to move, be creative, sing, play, listen to stories, invent stories, re-enact stories, draw, read, role play etc. (Blackmore, Bateman; Loughlin, O'Mara & Aranda (2011), Oblinger, 2006; Chism, and Bickford, 2002)

What is Physical Learning Space?

Wikipedia free encyclopedia (2017) explained that the physical learning space refers to a physical setting for learning, or a place in which teaching and learning occur. Although the physical structure of a classroom is a critical variable which affects students' morale and learning, the dynamics of teaching and learning today has expanded the boundaries of the classroom, making it flexible and collapsible. Hence, learning space is not limited in space (classroom) and time (period of the lesson) as it also includes outdoor location, or virtual learning spaces.

Similarly, even when we refer to a physical classroom space in the 21st century, it is no longer the conventional classroom that has the teacher's desk in front. Rather, it is a learning space with flexible seating arrangement which can be varied depending on the purpose of the lesson and different seating options. This makes for a collaborative classroom that encourages both individual and collective voices. It creates a classroom atmosphere where pupils are active, feel free to ask and answer questions, retell and re-enact stories and better understand their evolving roles as co-constructors of knowledge (Blackmore, Bateman; Loughlin, O'Mara & Aranda, 2011). Learning spaces encourage student centered pedagogical

approaches (pedagogical spaces) like Each one teach one,Freeze frame, Devil's advocate, Hot seating, Mind movies, Using photographs, Story map etc. These experiential learning strategies ensure that the environment facilitates communication, collaboration, negotiation, and interaction between learners, and between teachers and learners (Chism & Bickford, 2002; Blackmore, Bateman, Loughlin, O'Mara & Aranda, 2011).

Specifically, the physical learning space for literacy learning should include:

- ✓ Spaces where students can talk, listen, read and write.
- ✓ Board and/or wall space for co-constructed documentation, anchor charts, shared writing texts.
- ✓ A variety of learning materials that are "found" and often contributed by pupils and families, along with commercial materials that are relevant to the pupils' learning.
- ✓ Small/ portable blackboards and other writing materials located in various areas where pupils work to allow for writing and recording of thinking

In addition to the above, Student Achievement Division (2012) specified some criteria for assessing a good physical learning space and these are:

- ➢ A large gathering space for whole-group work and discussions, located near whiteboards, easels and/or projector screens.
- ➢ A gathering space for small-group and whole-group discussions – where pupils can see clearly the representations of learning that are posted on boards or screens and hear classmates as they share ideas.
- ➢ Flexible and reconfigurable space for small-group collaborative work and inquiry – space that allows groupings of various sizes, such as pairs and groups of four or more.
- ➢ Desks and tables configured to facilitate discussion by allowing eye contact with peers and teacher, the unencumbered flow of traffic and enough space for students to write collaboratively.
- ➢ Active areas for inquiry, investigation and wonder, and quiet areas for thinking and exploring technology – all areas need to be accessible to students for communicating and documenting their own learning (e.g., computers, computer software, tablets, digital cameras and video recorders, document cameras, interactive white boards).
- ➢ Instructional materials organized within their level for easy access.

Physical learning space is critical in literacy development. It enhances oracy which is a core factor in literacy development; talk, or oracy, is the foundation of literacy. As a matter of fact, young children must first listen and speak well before they can read or write. Put differently, as they talk, they learn to manipulate their environment with spoken words before they learn

to do so with written words. The role of oracy in the classroom can therefore be seen as performing two key functions:

Firstly, it can provide opportunities for learners to develop and extend their speech repertoire. This can also give them chances to orally rehearse sentence structures and vocabulary they have acquired which may in turn become part of their speech repertoire and written language.

Secondly, talk is seen as a tool for developing pupils' thought processes. In these models, learner to learner or to teacher talk gives learners opportunities to explore understanding and develop strategies for problem solving. Talk becomes critical when students discuss tasks or ideas and question one another, negotiate meaning, clarify their own understanding, and make their ideas comprehensible to their partners (social constructivism) (Bagdi & Vacca, 2005; Fisher & Frey, 2008).

It is obvious that for children to become more active in using language as a tool for both solitary and collective thinking, they need involvement in thoughtful and reasoned dialogue. In contexts, conversational partners 'model' useful language strategies which learners can practise using to reason, reflect, enquire and explain their thoughts to others This approach enables the learner to bring his experience to bear on the task. In this way, physical movements, such as, manipulation with real world objects, gestures, and bodily posture changes, combine with higher order cognitive activities, like thinking, reasoning and reflecting facilitates comprehension, (Blackmore, Bateman, Loughlin, O'Mara & Aranda, 2011).

Furthermore, enabling explorative play within the real world stimulates independent discovery, and facilitates both the acquisition of information about the environment and experience within it. In addition, exploration of different combinations of information can enhance creativity (Fisher & Frey, 2008). The implication of the above is that for children to be able to use language as a tool for both solitary and collective thinking, they need involvement in thoughtful and reasoned dialogue. This calls for the use of learning centres in enhancing the literacy skills of pupils for effective comprehension; such centres provides context for interaction and language use.

Theoretical Framework: Constructivist Theory of Learning

The emergence of the constructivist theory of learning has had immense influence on the shift from the product-driven learning to the process-driven system. The constructivists' theories state that learners construct knowledge by understanding new information and building on their current understanding and expertise. This is why constructivism believes that knowledge is not given but constructed by the learners based on previous experience. This does not mean that students are supposed to become independent learners in the absence of the teacher. Rather, the classrooms are structured in such a way that students are introduced to ideas in the first instance. Thereafter, they are provided with context and opportunities to work with these ideas collaboratively before being expected to complete tasks independently. In addition, cultural background and social interaction are inherent components of this knowledge

construction. This is due to the fact that one's understanding and knowledge stems from one's experience of the world and it is developed through social interaction.

This is why teaching theories today swing between the cognitive constructivists' teaching approaches and the social constructivists' approach. The cognitive constructivists' approach emphasizes practical activity, direct experience, exploration and physical manipulation of materials, which ensures that pupils make sense from what they are doing/ thinking– explain what you think. In contrast, the social constructivists emphasize making meaning through social negotiation, interacting with the More Knowledgeable Others (MKO) (Vygotsky 1978). Other strategies include the use of scaffolding and helping children learn to work within this Zone of Proximal Development**.** Working below it means that the child learns nothing new (Jerome Bruner 1915).This is why learning centres are considered critical in literacy development especially in second language context; it provides ample opportunities for learners to not only use the target language, but to be actively involved in their learning. It is a well-known fact that interaction with one another and the environment underpins our learning and development. Active involvement in engaged learning through interaction and participation are central to effective learning. Thus, effective learning takes place when meaning is taken from experience with the world, and when children through their own experience discover what is ''going on in their own heads'' (Bruner, 1973, p. 72). Physical engagement in the learning process creates involvement and enhances learning unlike passive listening.

Using Learning Centers to Facilitate Learner Talk

Scholars are of the view that if multiple opportunities are provided for pupils learning to read and write, they will acquire the skills faster than if repetitive drills and memorization of words and structures are emphasized in teaching. This underlines the use of literacy learning centres as a pedagogical approach. A classroom can have different literacy learning centres that define the kind of activities which children are expected to use in it. For instance, there can be: books and language areas, dramatic play area (play kitchen, dress-up materials), circle time, story centre, play centre, house pretend centre etc. These centres have related resources which are colourful, clean, safe, relevant and attractive and in good condition and placed within the eye level of the children so that they can play with them.

Literacy learning centres offer meaningful learning experiences where pupils work independently or collaboratively to meet literacy goals. They are designed to provide appropriate materials, resources, environment/space to help pupils work independently or collaboratively with other pupils in small groups or work with their teachers or collaborate with other pupils using the multimedia. Collaborating with others keeps pupils longer on a task and facilitates problem-solving because pupils are able to explore, invent, discover, and create alone or with others at such centres (Stone, 1996). Classrooms should therefore be filled with talk in view of the fact that we want pupils to be filled with thinking.

The importance of physical learning spaces (such as learning centres) in the literacy development of pupils is emphasized in the National Policy on Education FRN (2013) as well as some of the pedagogical approaches recommended in the Early Child Care Education Curriculum such as Reggio Emilia, Indigenous Communicative Method etc. However, scholars argue that caregivers and teachers rarely use these learning centres, given the mismatch between pupils' literacy level and the expected literacy level. Also, there is a dropout rate and this is attributed to pupils' inability to read and write, (Nakpodia, 2011). It is based on this gap that this study has been undertaken to explore the impact of physical learning spaces such as learning centres on the reading comprehension skills of pupils in the middle basic education level. Specifically, this study sought to do the following:

1. Determine the effects of learning centres on pupils' ability to reason along with the writer as measured by a reading comprehension passage
2. Find out if there will be a difference in the comprehension skills of male and female pupils based on the reading passage

Research Questions

1. Is there any mean difference between the performance of students taught reading comprehension with literacy learning centres and those taught in normal classroom environment?
2. Is there any difference in the mean scores of male and female students taught reading comprehension using literacy learning centres and those taught in normal classroom environment?

Hypotheses

1 There is no significant difference between the performance of students taught reading comprehension with literacy learning centres and those taught in normal classroom environment?

2 There is no significant difference between the performance of male and female students taught reading comprehension with literacy learning centres and those taught in normal classroom environment

Method

The study is a quasi-experiment using pre-test and post-test design. There are twogroups: experimental and control. (See below)

Group	Pre-test	Treatment	Post-test
A	O_1	LLC	O_1
B	O_2	NCE	O_2

Where A, B = Experimental Groups

O_1 = Pre-test (Literacy Learning Centres, LLC)

O_2 = Post-test (LLC)

LLC = Treatment (Literacy Learning Centres)

NCE = Normal Classroom Environment

The population of the study comprised all the primary four pupils of Alvan Staff Primary School, Owerri, in the 2016/2017 academic session totalling 120. Two intact classes out of the six classes comprising 40 pupils were used. To ensure homogeneity and consistency, the LLCT was given to the 40 students and they were then grouped based on their performance in the pre-test (above average, average and below average). The subjects were then grouped into the two, A and B, using numbered papers. Each group had equal number of students with the grades, above average, average and below average.

The LLCT used for the treatment was a researcher made reading comprehension test drawn from the learning centres. They contained information on sentence centre, word centre, story centre and picture centre. The test was constructed by the researchers from the topics selected through differentiation. Each correctly answered item attracted 2 marks and a maximum of 100%. The LLCT was administered before (pre-test) and after (post-test) treatment for data collection. The pre-test had the same features as the post-test items. The only difference was that the post-test items were reshuffled and the colour of paper was changed to avoid test 'wiseness'.

The instrument was validated by one expert each from the Departments of Curriculum and Instruction, English Language, and Measurement and Evaluation. The corrections they made were effected in the final draft. The test was subjected to reliability testing using 20 students outside the study population. The result of test –retest on 20 students outside the population yielded a reliability coefficient of 0.73 when data were subjected to Kuder Richardson formula 20. This result was judged to be reliable.

Data collection started after the administration of the LLCT in the first session. This was used in grouping the students into two homogeneous groups as well as establishing the baseline of the study. The next session was conducting the actual experiment. The two groups, A and B, were taught for six weeks. Within the six weeks, group A was taught with LLC while group B was taught with Normal Classroom Environment (NCE), thereby acting as the control group. In the third session, post-test was administered, corrected and graded with the marking scheme as shown by the LLCT, to ensure uniformity and elimination of bias. The data collected were analysed using ANOVA at 0.05 level of significance. The researchers ensured that extraneous variables were controlled by using the same teacher and spending equal length of time with each group. The test instruments were structured and secured. The researchers emphasized the need to attend classes regularly. The pre-test also ensured group equivalence.

Results

The results are presented in the tables below under each research question and hypotheses.

Research Question 1: Is there any mean difference between the performance of students taught reading comprehension with literacy learning centres and those taught in normal classroom environment?

Table 1: t-test analysis of data on pre and posttest students taught using LLC and those taught with NCE

Group	N	X	SD	DF	t-cal	t-critical	Decision
Literacy learning centres	20	61.5	19	38	12.5	1.697	Significant
Normal classroom environment	20	49.5	1.93				

The above table shows that those taught using literacy learning centres obtained a mean of 61.5 and a standard deviation of 19 while those taught with normal classroom environment obtained a mean of 49.5 and a standard deviation of 1.9. The t-test comparison of the mean scores of the two groups yielded a t- calculated value of 12.5 and t-value of 1.697 at 0.05 level of significance with df 38. Hence there is a significant difference between those taught with literacy learning centres and those taught with normal classroom environment.

Research Question 2: Is there any difference in the mean scores of male and female students taught English language with literacy learning centres and those taught in normal classroom environment?

Table 2: t-test analysis of data on post-test of male and female students taught using LLC and those taught using NCE

Group	N	X	SD	DF	T-cal	T-critical	Decision
Male	20	62.2	2.64	38	1.51	1.697	Not significant
Female	20	60.9	2.8				

The above table shows that male students taught using literacy learning centres obtained a mean of 62.2 and a standard deviation of 2.64 while female students taught using literacy learning centres obtained a mean of 60.9 and a standard deviation of 2.8. The t-test

comparison of the mean scores of the two groups yielded a t- calculated value of 1.51 and t-value of 1.697 at 0.05 level of significance with df 38. Hence there is no significant difference between male and female taught with literacy learning centres and those taught with normal classroom environment.

Test of Hypotheses

Hypothesis 1: There is no significant difference between the performance of students taught reading comprehension with literacy learning centres and those taught in normal classroom environment.

Table 3: Analysis of variance of data on pre and post-test of students' performance of those taught using LLC and those taught using NCE.

Sources of Variations	Sum of Squares	Mean Squares	Df	T-cal	T-critical	Decision
Between (group)	5808.1	5808.1	1			Significant
				4.14	2.85	
Within (group)	53214.6	1400.4	38			
Total	**59022.7**		**39**			

The above table shows F-calculated of 4.14 at 0.05 level of significance and F-critical 1,38 = 2.85. Since the F-calculated is larger than the critical value, we reject null hypothesis of equal population means and conclude that there is a significant difference among student performance of those taught reading comprehension using literacy centres and those taught in normal classrooms without literacy centres.

Hypothesis 2: There is no significant difference between the performance of male and female students taught reading comprehension with literacy learning centres and those taught in normal classroom environment

Table 4: Analysis of variance of data on post-test of male and female students' performance of those taught using LLC and those taught using NCE

Sources of Variations	Sum of Squares	Mean Squares	Df	T-cal	T-critical	Decision
Between (group)	1478.5	492.8	3			Significant
				65.7	2.87	
Within (group)	272.1	7.5	36			
Total	**1750.6**		**39**			

The above table shows F-calculated of 65.7 is large than the F-critical 3.36 = 2.87, we reject null hypothesis and conclude that there is a significant difference among male and female students' performance in the reading comprehension test.

Discussion

The result of this study shows that the experimental group obtained a higher mean than the control group on students' performance on LLC. The difference between their mean scores was significant at 0.05 level of significance. The t-cal value yielded 12.5 and t-critical 1.697 with df 38 at 0.05 level of significance (see table 1), while the analysis of variance (ANOVA) showed a calculated F value of 4.14 and F critical 2.85 at 0.05 level of significance (see table 3). These findings corroborate each other showing significant difference due to treatment; which implies that the use of LLC in teaching reading comprehension produced superior performance in the learners than the use of the NCE. The findings of this study are consistent with findings of other scholars such as Chism, and Bickford (2002), Blackmore, Bateman, Loughlin, O'Mara & Aranda (2011) and Student Achievement Division (2012) which found that the use of learning centres encourage learner initiated talk that facilitates deep learning through negotiation of meaning which facilitates better comprehension of the passage read. Consequently, its use in teaching is capable of keeping learners longer on the task, engaged and making them more productive.

In table 2, the data revealed no significant difference between male and female students taught reading comprehension using LLC and NCE but the test for null hypothesis (table 4) showed a significant difference. This led to the rejection of the null hypothesis and upholding of the alternative hypothesis. The conclusion is that there is significant difference in the mean scores of male and female students in favour of the male students who had a higher mean score than the females.

Conclusion

This study sought to examine the effects of the use of LLC and NCE in teaching reading comprehension on students' performance. The findings of the study revealed a significant difference in the mean scores of the students taught using LLC and NCE. This difference was attributed to the treatment given as both groups were equivalent at the beginning of the treatment. Significant difference was noted between male and female students taught using LLC, which implies that, its use discriminates between sexes.

Recommendations

Based on the findings of the study, the researchers recommend the following:

1. That learning centres be used in teaching different English language skills and components in order to enhance literacy in the target language.

2. Language teachers should source for local resources rather than waiting for already made resources given the importance of learning centres in stimulating interaction for effective literacy development.
3. Workshops should be organized to help teachers understand how to stimulate activities using this learning centres

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